JULY 7, 1952

Brown Univ

STEEL

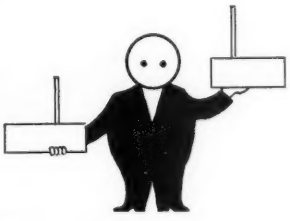
THE WEEKLY MAGAZINE OF METALWORKING

JUL -8 1952 LIBRARY

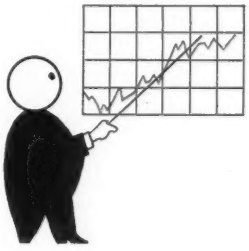
Tips On Renegotiation

Renegotiation is as important to your pocketbook as your tax return. Give it as much attention

In preparing your case, give complete details, be fair, don't hesitate to put your best foot forward

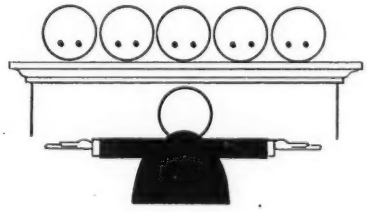


Compare your performance with that of your industry generally



Include proof of your company's efficiency on defense contracts

If yours is a complex case, seek accounting and/or legal advice



If yours is a small company, see the Renegotiation Board alone. If big, don't take too many colleagues along

For more tips, see page 72

FASTENERS
Strike Strips Supplies, p. 63

STEEL RESEARCH TOOL
High Speed Photography, p. 90

SPARK MACHINING
Meets Superalloy Challenge, p. 92

GRINDING, BRUSH FINISHING
One Machine Can Do It, p. 94

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That's All the Cleaning an Allis-Chalmers TEFC Motor Ever Needs

MAINTENANCE COSTS ARE LOW for users of Allis-Chalmers Totally-Enclosed, Fan-Cooled Motors. They are easy to clean because even the stickiest dirt can be wiped or blown off without dismantling the motor or even stopping it. They seldom require cleaning because cooling air flows over the *outside* of the motor. There are no external concealed air passages to clog up and cause over-heating. You get better operational continuity, lower maintenance.

Bearings Save Maintenance, Too

Double-shielded ball bearings require no regular maintenance under most normal operating conditions. Yet if difficult service makes re-lubrication desirable, it can be done without dismantling the motor or bearings. Rigid cast iron frame and stiff end brackets maintain bearing alignment . . . assure maximum bearing life.

A-3639

Texrope and *Vari-Pitch* are Allis-Chalmers Trademarks.

ALLIS-CHALMERS

Get The Full Story Now

Your Allis-Chalmers Authorized Dealer or District Office can give you complete information on Allis-Chalmers Totally-Enclosed, Fan-Cooled Motors and how they can save you money. Call one of them today or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 51B7225.

Sold . . Applied . . Serviced . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

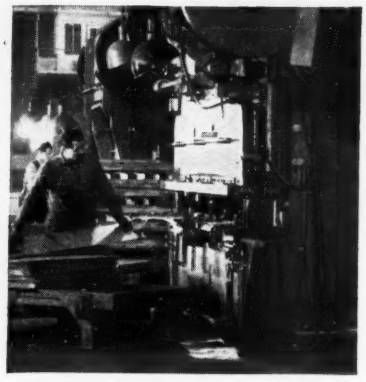
***TEXROPE* — Belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.**

PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

In the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation



Our Brake Die Steel Solves Wear and Warp Problems

We've never introduced a more popular specialty steel. And there are good reasons why more and more shops are becoming regular customers for our Brake Die Steel. One distributor writes: "Your Brake Die Steel is going over big out here. Not only does it machine easily, but it holds its size and shape beautifully." Another says: "My customers are highly pleased because it wears and wears . . . die costs have been cut in half."

Many shops are accustomed to using just any kind of steel. Now they're finding it's a whale of a saving to use a steel that's specially intended for dies used in sheet-metal brakes.

Our Brake Die Steel saves time and money right at the start because we ship it in the heat-treated condition — it's ready to machine, needs no further hardening. Every bar is carefully heat-treated by oil-quenching and tempering. Then it is straightened, stress-relief-annealed and straightened again so that it won't warp when machined to contour by the die-maker.

Here's a steel you can count on to *stay* straight. Best of all, it far outwears ordinary steels.

We stock Bethlehem Brake Die Steel in standard sizes in our Mill Depot; it's also stocked by many distributors of Bethlehem tool steels. Folder 560 gives full details.

This four-way die is typical of the uses of our Brake Die Steel.

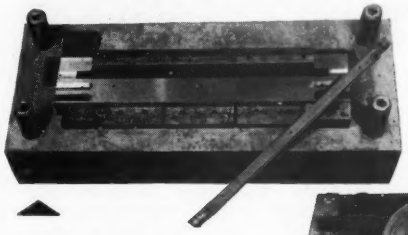
Lehigh H Tool Steel Helps Build Big Grain Combines

It's easy to see why the modern self-propelled combine makes old-timers blink in admiration and wonder. One such machine made by Gleaner Harvester Corp., Independence, Mo., requires but one man at the controls. It performs a continuous harvesting operation as it cuts a 14-ft swath through vast fields. Cleaned grain pours into a 50-bushel bin in a steady stream. In just 90 seconds the bin can be unloaded while the machine continues on the go.

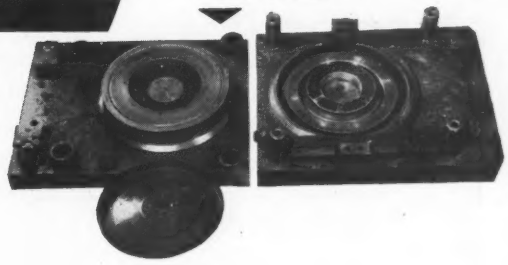
It takes precision manufacturing to make these mechanical marvels run smoothly and dependably. And that's where Bethlehem tool steel comes in.

Our Lehigh H tool steel, for example, is used for a variety of tools and dies that turn out many vital combine parts from sheet steel. Gleaner's well-equipped toolmaking division reports complete satisfaction with this fine grade of air-hardening tool steel. Its high-carbon, high-chromium content makes it first choice for high production because of its long-wearing properties. And it has minimum distortion during heat-treatment.

This Gleaner-Baldwin self-propelled combine does everything but bake the bread as it cuts a 14-ft swath in a wheat field. It's a one-man operation.



Raddle slats, which convey the crop to the combine separator, are produced from 12-gage sheet steel by this die of Lehigh H tool steel which forms, pierces, and cuts off. Die shown has already produced about 100,000 pieces.



Lehigh H is also used in this blanking, flanging, and dishing die which produces a 17-in.-diameter cylinder head for the threshing mechanism. This die operates in a 400-ton press.

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Use Shock Steels for Shock Tools

When using standard manganese oil-hardening tool steels (such as our BTR grade) for jobs requiring more than average shock-resistance, the usual practice is to temper the tool or die so that the hardness is reduced to about 50 Rockwell C. This is not recommended, because at a given hardness a steel of this type, having a relatively high carbon content, can't match the shock properties of a lower-carbon, shock-resisting steel.

If a tool has to be tempered that far to get the necessary toughness, then probably a shock-resisting steel should be used rather than a general-purpose steel. Omega, our silico-manganese steel, is ideal for all types of cold-battering tools . . . and 67 Chisel, our chrome-tungsten grade, is the steel to use for a wide variety of shock tools and master hobs.

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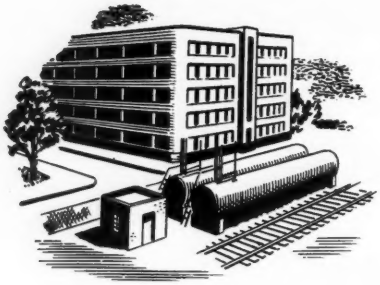

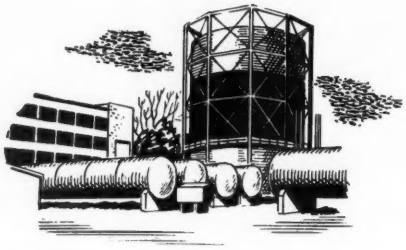

PHILGAS BENEFITS: This top-quality Phillips *66* butane-propane fuel is uniform in thermal value and gravity. Free from harmful contaminants, it burns *clean!* Automatic operation cuts down on overhead, assures constant furnace temperatures, atmospheres and pressures.

PHILGAS USES: Leading industries use Philgas successfully for heat treating, mold drying, core baking, ceramic firing and many other operations. Many progressive utilities also find it advantageous to augment their natural or manufactured gas output with clean-burning, reliable Philgas.

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Only B. F. Goodrich makes the grommet belts that cut costs 20 to 50%!

Save 3 ways! Investigate today! Write or mail coupon

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord *section* as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

All cords put to work

Each of the two grommets and every part of a grommet carry their share of the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ⅓ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:

"... within a few days ordinary belts had stretched ... After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all ..."

"Ordinary belts lasted only 5 or 6 weeks ... B. F. Goodrich grommet belts are in their sixth month of service ..."

"Previous belts suffered from shock loads, wore out fast ... BFG grommet belts have been in service 2 years with no shut-downs..."

There are hundreds of cases like these.

They cost no more

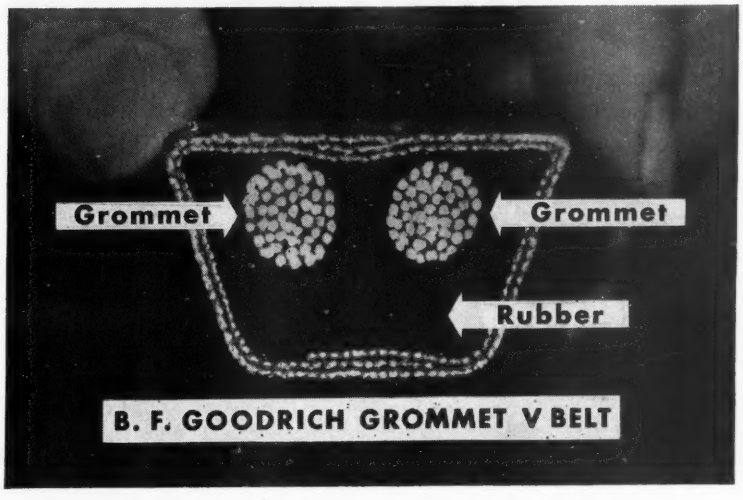
BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,233,294).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

Grommet V Belts BY

B.F.Goodrich

FIRST IN RUBBER



The B. F. Goodrich Company
Dept. S-7
Akron, Ohio

☐ Send set of reports telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.

☐ Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

Name_____

Firm Name_____

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City_____

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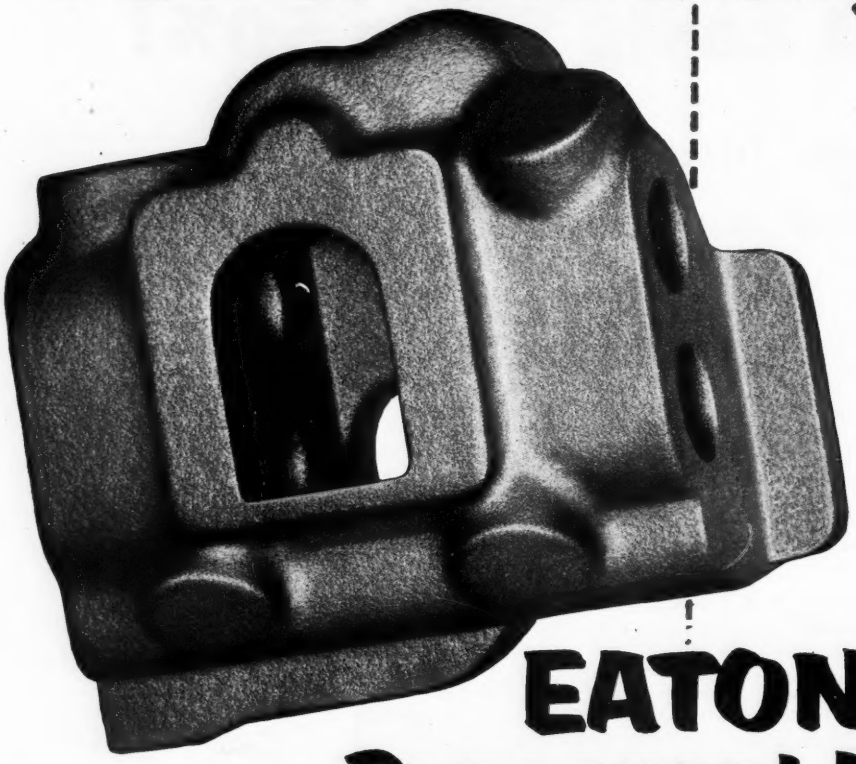
For better Power Steering



EATON Permanent Mold Gray Iron Castings

Send for your copy of the illustrated booklet, "A Picture Tour of the Eaton Permanent Mold Foundry."

Free machinability
Dense, non-porous structure
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This Week in Metalworking

STEEL

Vol. 131 No. 1 July 7, 1952

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CHROMEL-ALUMEL, Cat. No. 1234, 14 ga., SOLID-DUPLEX, each wire enamel, felted asbestos, Asbestos-yarn braid overall.

IRON-CONSTANTAN, Cat. No. 1236-C, 14 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.

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Behind the Scenes...

Cover Stories

The picture on the June 23rd issue of STEEL made for one of the easiest cover jobs in some time. Used to highlight the cutting fluid article, the picture was furnished by the Warner & Swasey Co., Cleveland.

It was the first picture sent in and when the art department saw it, they decided to look no further. It has the looks of well-balanced light and shadow and is well composed. In addition to that, an unusual bit of realism is present in the chips left in the pan of the machine.

This week's cover is a rather unusual treatment of a rather common headache. In pictogram form it shows you going through the sweat and turmoil of trying to find the best way to renegotiate defense contracts. The tips came from our renegotiation expert, John Morgan, who compiled a list of ideas on preparing to meet with the Renegotiation Board.

More Awards for STEEL

STEEL is a winner. The editors have won two awards of merit in the fourteenth annual competition held by Industrial Marketing. That's a total of seven awards won in the last three years.

Latest winners are "Who Has the World's Metals?" for best original research and six front covers with accompanying inside articles for best graphic presentation. The research piece was put together by Managing Editor Walt Campbell for the Oct. 8, 1951, issue.

Technical Abundance

There were 373 technical articles and features published in the technical section of STEEL during 1951. They would have filled a book 767 pages thick. In addition there were 208 pages of new production and equipment descriptions. Not included in the tabulation are short stories, book reviews, picture-caption-stories etc.

The editors cover more than 16 general production-engineering subjects, including steel and metal production; forging, forming, stamping, drawing, extruding; casting methods, heat treating; machining practice, tooling methods; welding, brazing, soldering, cutting, joining; surface treatment; assembly methods and fabrication; inspection and testing; materials handling; product design; materials and components; refractories and their applications; drives and controls and roundup reports on latest engineering trends.

The coverage is even wider this year. For a sample, begin on p. 89.

Spreading the Word

The article "Is Steel Management Free To Manage?" by Managing Editor Walt Campbell in the Apr. 14 issue, p. 65, is being sent in reprinted form to all persons on the public mailing list of American Steel & Wire Division, U. S. Steel Co.

We're glad to see that sort of information getting around. We too think it's important.

Lest We Forget

Some used car dealers, taking a tip from television merchandising experts, are installing coin meters in the dashboards of their cars to keep the buyer up-to-date on his payments. A quarter must be deposited before the ignition can be turned on.

After five miles of travel, a buzzer sound and another quarter is required to keep the car from stopping via the ignition cutout.

Puzzle Corner

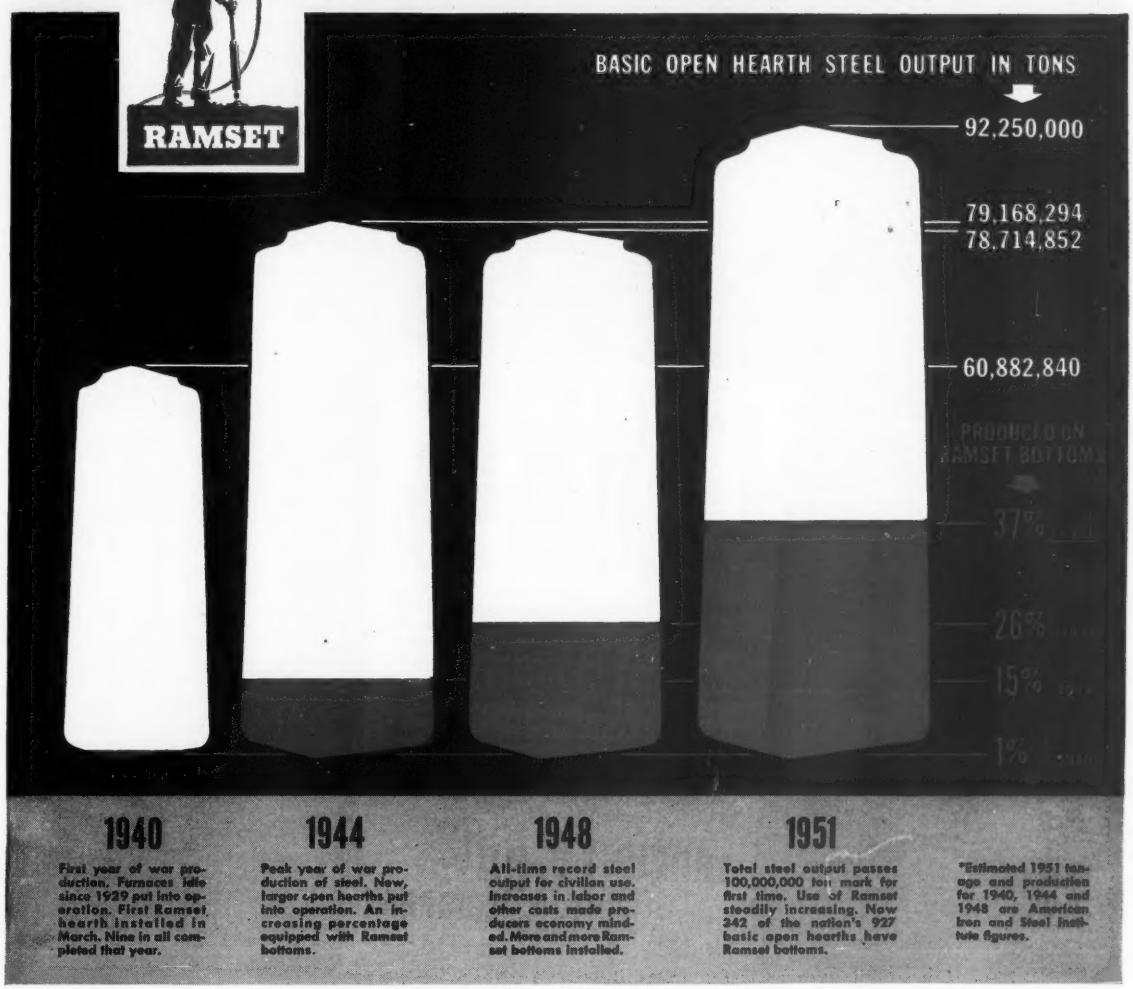
In the June 23 problem, 256 acres were distributed. First in with that correct answer were Merlin S. Gaylord of Defiance Stamping Co.; Robert Huff of Canton, O.; T. S. Bean of Barber & Ross Co.; M. F. Coon of Sharon Steel Corp.; R. C. Reinker of Ashtabula Bow Socket Co.; E. T. Brace of R. D. Werner Co., Greenville, Pa.; L. D. Rice of Timken Roller Bearing Co.; and Bob Knop of Wolverine Tool Co.

If five cats catch five rats in five minutes, how many cats will be required to catch 100 rats in 100 minutes?

Shrdlu

(Metalworking Outlook—Page 53)

GROWTH OF A GOOD IDEA


RAMSET
BASIC OPEN HEARTH STEEL OUTPUT IN TONS
92,250,000
79,168,294
78,714,852
60,882,840
PRODUCED ON RAMSET BOTTOMS
37%
26%
15%
1%
1940
First year of war production. Furnaces idle since 1929 put into operation. First Ramset hearth installed in March. Nine in all completed that year.
1944
Peak year of war production of steel. Now, larger open hearths put into operation. An increasing percentage equipped with Ramset bottoms.
1948
All-time record steel output for civilian use. Increases in labor and other costs made producers economy minded. More and more Ramset bottoms installed.
1951
Total steel output passes 100,000,000 ton mark for first time. Use of Ramset steadily increasing. Now 242 of the nation's 927 basic open hearths have Ramset bottoms.
*Estimated 1951 tonnage and production for 1940, 1944 and 1948 are American Iron and Steel Institute figures.

STEEL production has nearly doubled since 1940, yet the number of open hearth furnaces has actually dropped. Larger capacities of the newer furnaces tell only part of the story. A major factor has been increased efficiency in the use of existing equipment.

Basic Refractories is proud to have contributed to this increased efficiency through the development of Ramset. Introduced in 1940 the use of this magnesia ramming mix has steadily increased until now over a third of all basic open hearths have Ramset bottoms.

There are three principal reasons why more and more rammed hearths are in use: (1) The refractory itself is right for the job—constantly improved through Basic research with the cooperation of practical steel makers; (2) Ramset rammed hearths save time, fuel, labor and brickwork compared with the traditional burned-in magnesite; (3) Correct installation procedure is supervised by skilled Basic engineers employing specially designed equipment.

We look forward to the continuing opportunity to serve the industry with more Ramset bottoms, thus to help produce more efficiently the increased tonnage of steel demanded for defense and civilian needs.

BASIC FURNACE REFRACTORIES

Basic Refractories Incorporated

845 HANNA BUILDING, CLEVELAND 15, OHIO

Write for free booklet "Underlying Steel". This graphic booklet tells the story in words and pictures of granular basic refractories and their role in the production of open hearth steel. Address Dept. 16.

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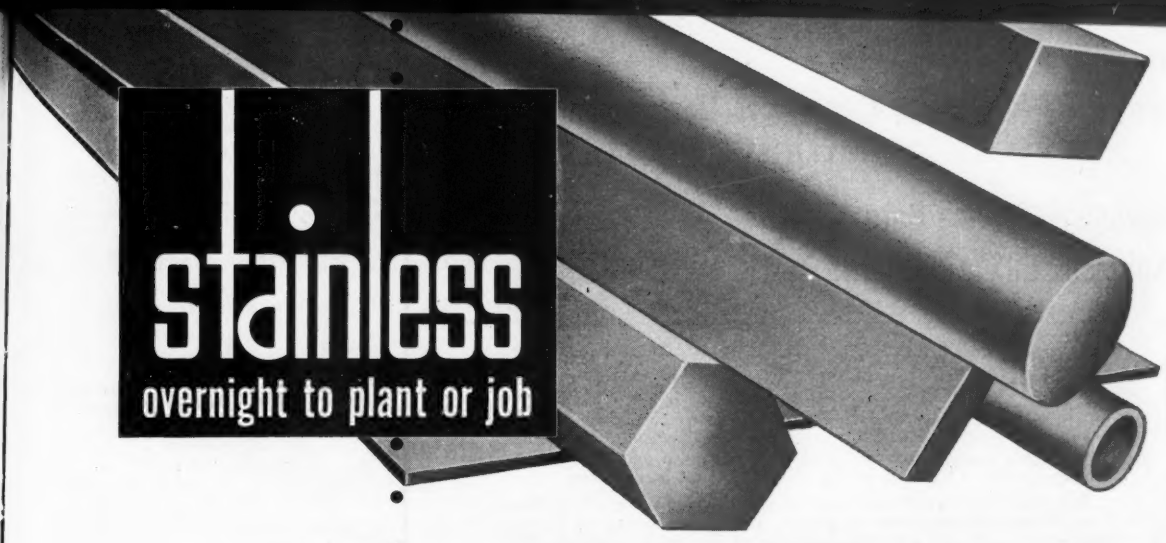

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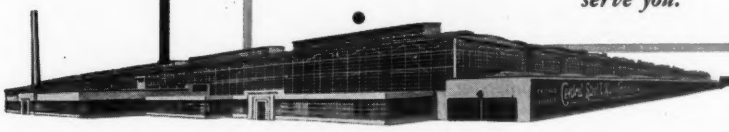
Type 430 Sheets in complete size and gauge ranges . . . in finishes you may require.

Type 416 Bars—Rounds, Squares and Hexagons—are available in a wide range of sizes and finishes.

Types 302, 303, 304, 309 and 316 are currently available from stock for defense end uses.

Call CENTRAL STEEL the next time you need Stainless Steel—we will welcome the opportunity to serve you.



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Technical Service Data Sheet
Subject: RUST PROOFING WITH PERMADINE®

INTRODUCTION:

Ferrous metal parts that have been Permadized in a zinc phosphate chemical solution and then "sealed" with a rust-preventive oil such as "Granoleum" are effectively protected from rust-damage. In addition, if the surface is accidentally chipped or scratched, rusting is confined to the exposed area.

Rust proof coatings find many practical applications. During World Wars I and II most small arms were rust proofed by phosphate coating and impregnated with chromic acid and a rust preventive oil, or cutback petrolatum. This not only provided excellent corrosion resistance but also yielded a dull black non-reflecting surface. Rust proof finishes are now used widely on hardware, firearms, cartridge clips, metallic belt links, miscellaneous forgings and castings, tools, unpainted replacement machine parts, and many other similar items such as bolts, nuts, and washers.

THE PERMADIZING PROCESS:

For the most effective rust proofing of large or small work in large or small production, "Permadine" is used in tanks in an immersion process, with the bath heated to 190°-210°F., coating time 20 to 30 minutes. The coated parts are then rinsed in clean water, and then in a controlled dilute acidulated solution. After drying, a suitable corrosion-resistant oil such as "Granoleum" is applied.

Operations can be carried out with the work in crates, or hung from hooks, utilizing an overhead rail and hoists. For large volume production, automatic equipment can be used to mechanize the line. Small parts can be treated in tumbling barrels.

"PERMADINE" MEETS SERVICE SPECIFICATIONS:

The protective "Permadine" finish meets U.S.A. 57-0-2C; Type II, Class B, and equivalent requirements of:

MIL-C-16232,
Type II

U.S.A. 51-70-1,
Finish 22.02, Class B

AN-F-20

Navy Aeronautical M-364

JAN-L-548

"PERMADINE" DATA CHART

Type of coating	Zinc phosphate
Object of coating	Rust and corrosion prevention
Typical products treated	Nuts, bolts, screws, hardware items, tools, guns, cartridge clips, fire control instruments, metallic belt links, steel aircraft parts, certain steel projectiles and many other components
Scale of production	Large or small volume; large or small work
Method of application	Dip Barrel tumbling, racked or basketed work
Equipment notes	Immersion tanks of suitable capacity. Cleaning and rinsing stages can be of mild steel. Coating stage can be of heavy mild steel or stainless steel.
Chemicals required	"Permadine" No. 1
Pre-cleaning methods	Any common degreasing method can be used, Alkali cleaning ("Ridosol"), Acid cleaning ("Deoxidine"), Emulsion-alkali cleaning ("Ridosol"-"Ridoline"); vapor degreasing, solvent wiping, etc., are examples. Acid cleaning may need to follow other cleaning methods if rust or scale is present.
Bath Temperature	190° - 210°F.
Coating time	20 - 30 minutes
Coating weight range Mgs./Sq. Ft.	1000 - 4000
Technical Service Data Sheets	No. 7-20-1-2 T. M. No. 5

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "PERMADINE"
AND YOUR OWN METAL PROTECTION PROBLEMS

CHEMICALS ACP PROCESSES

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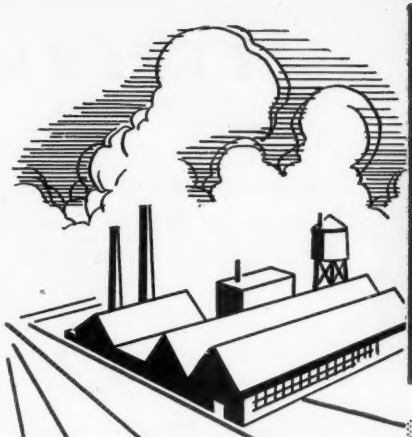
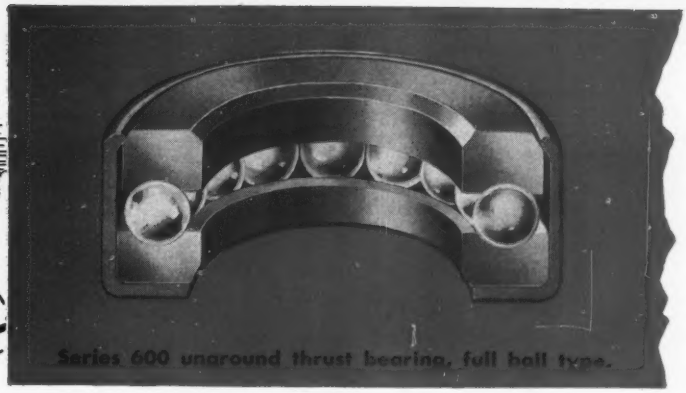
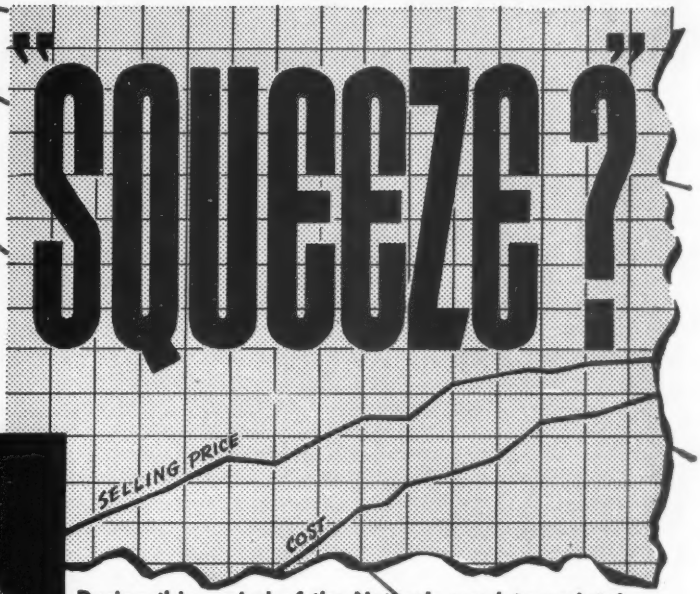




Series 600 unaround thrust bearing, full ball type.

CAUCHT IN THE "SQUEEZE?"

Our 50th Anniversary
1902 - 1952



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precision radial bearing, composition sealed.

During this period of the Nation's need to maintain a dual economy—production for the Defense Effort plus a percentage of civilian peacetime requirements, there can be no waste of either labor or materials. Especially is this true for the manufacturer "caught in the squeeze" between ceiling prices and still rising costs of material and labor.

Nice Ball Bearing Company produces complete lines of precision, semi-precision and unground ball bearings. Hence, NICE engineers can help solve your cost problems by designing or recommending the "exactly right" bearing for your particular application, *without sacrifice of product quality or performance.*

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LETTERS
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Please send 12 copies of the article in your June 2 issue "New Methods Make Stainless Extrusions Possible".

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R. N. Davis
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Youngstown, O.

Please send us a copy . . .

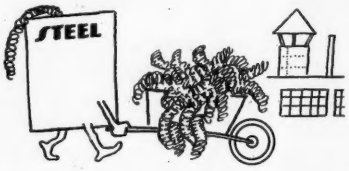
F. A. Fredrics
Bridgeport Brass Co.
Bridgeport, Conn.

• *They're on the way.*

Not Bored With Borings

We are very anxious to receive additional information on the subject of your article "New Process Reclaims Borings".

Walter W. Strite
Landis Tool Co.
Waynesboro, Pa.



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Kennedy-Van Saun Mfg. & Eng. Corp.
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J. C. Rankine
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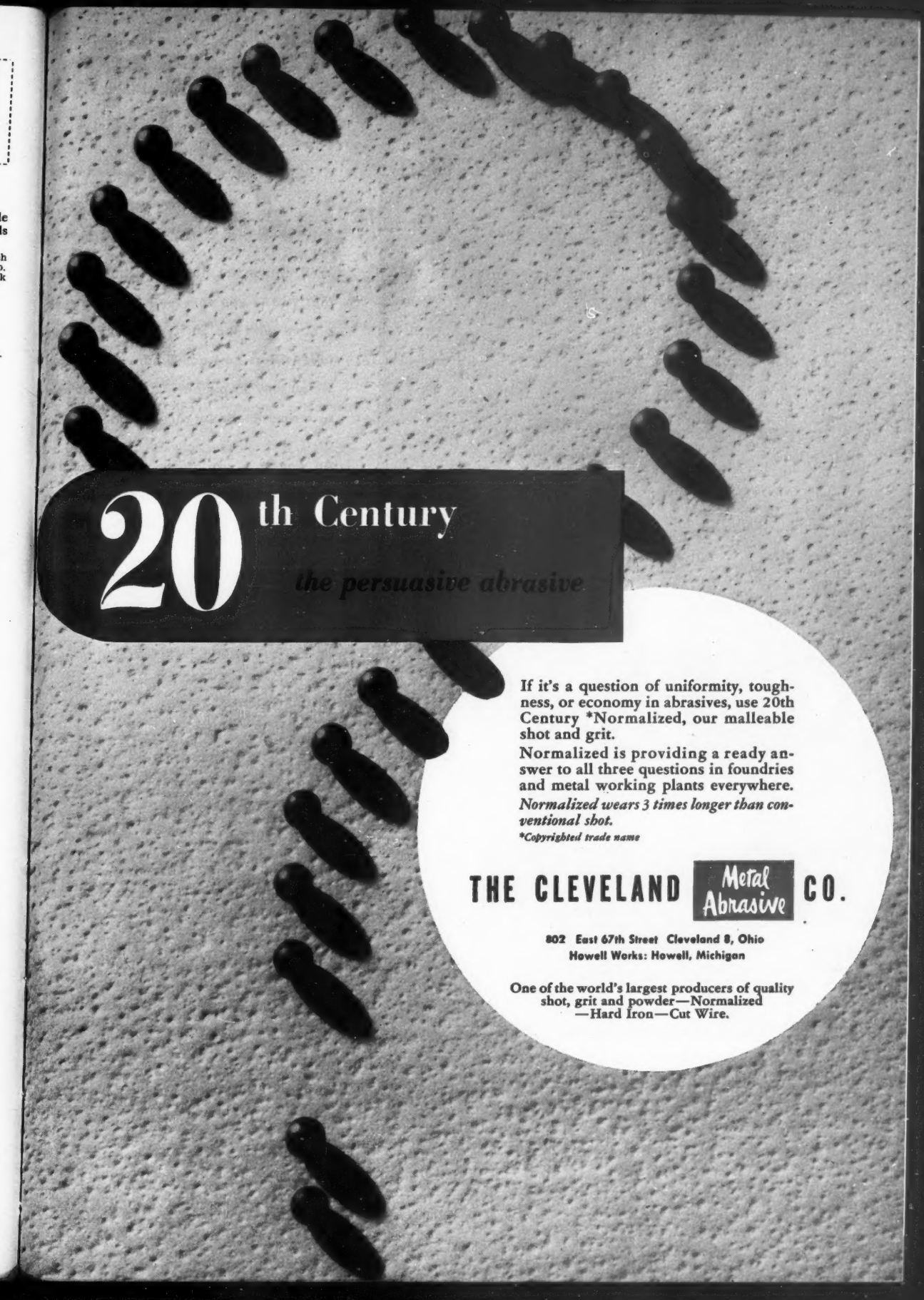
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Normalized is providing a ready answer to all three questions in foundries and metal working plants everywhere.
Normalized wears 3 times longer than conventional shot.
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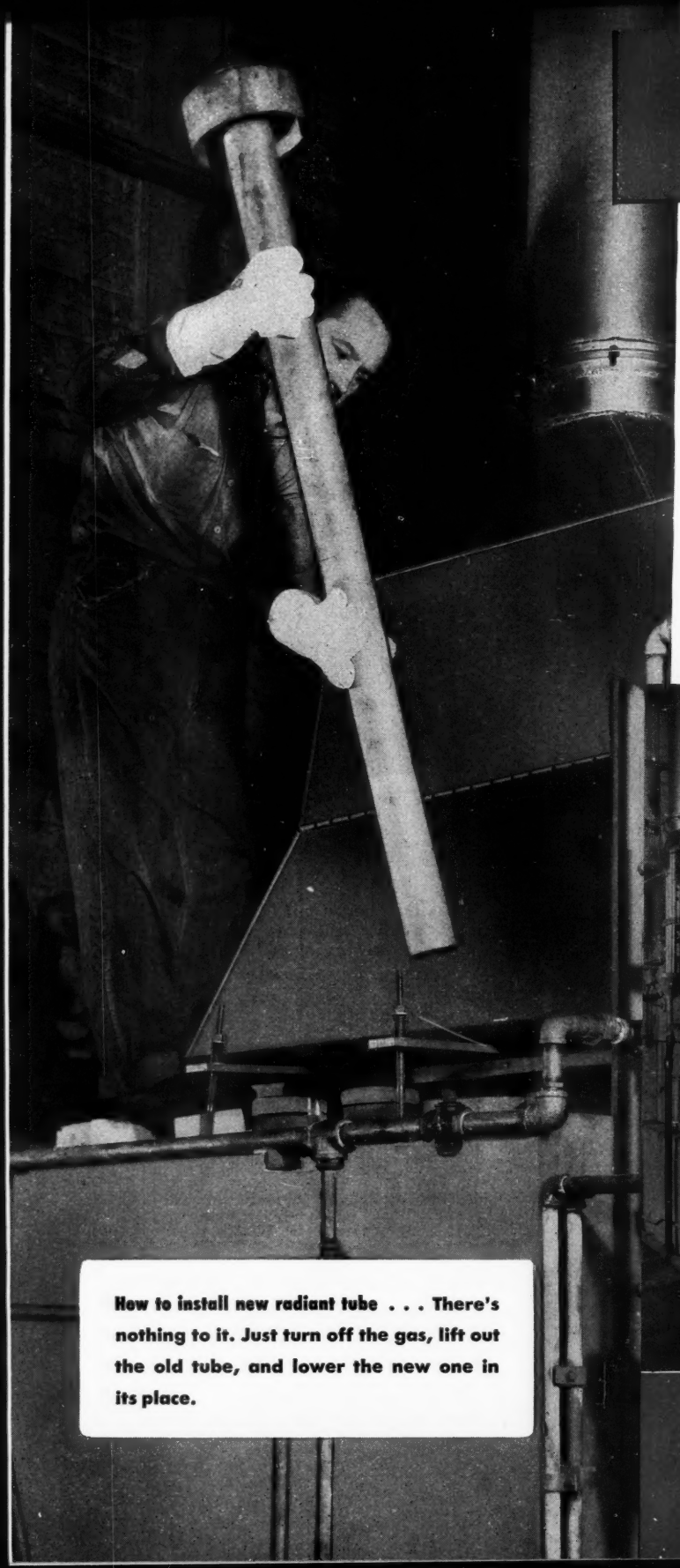
One of the world's largest producers of quality shot, grit and powder—Normalized —Hard Iron—Cut Wire.

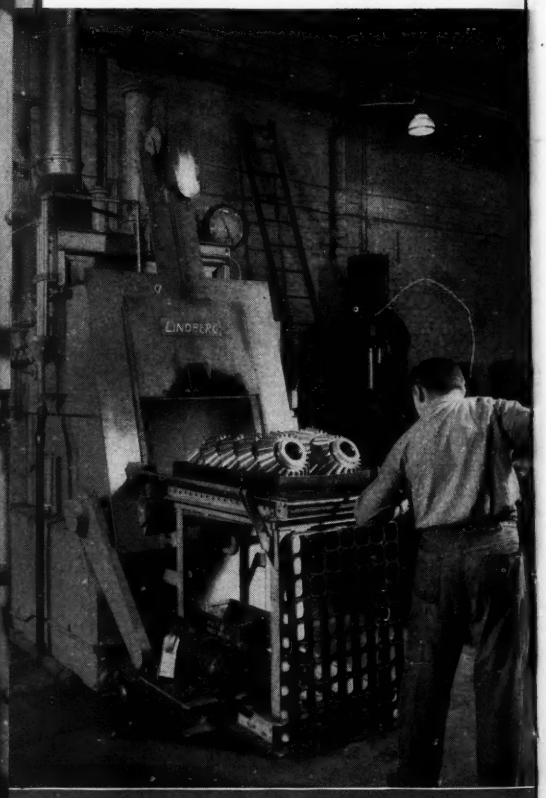
zip-zip . . . like in LINDBERG

Well, maybe not that fast . . . but it'll seem that fast if you've ever had to struggle around with the old type heavy radiant tubes. These new gas-fired, vertical tubes weigh only 29 pounds . . . almost as light as a razor blade by comparison.

All you do is turn off the gas, get on top the furnace, lift out the old tube, lower a new one in its place . . . and that's it.



How to install new radiant tube . . . There's nothing to it. Just turn off the gas, lift out the old tube, and lower the new one in its place.



The greatest advance in industrial furnace design and construction since Lindberg introduced the Cyclone forced convection tempering furnace back in 1935!

change radiant tubes blades in your razor!

CARBONITRIDING FURNACES

Simple, isn't it? No furnace cooling necessary . . . no extended down time . . . no clumsy plugs to unbolt . . . no squirming around inside the furnace.

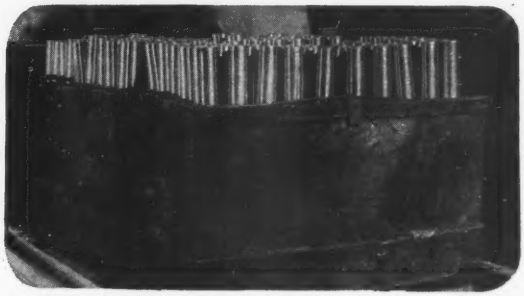
But ease of maintenance is only one of the advantages offered by this amazing Lindberg Carbonitriding Furnace. Check these important construction features:

Quench tank pit unnecessary . . . Your Lindberg Carbonitriding Furnace includes a built-in pitless quench tank . . . thus you avoid costly excavation and piping. But more important, this built-in quench tank minimizes distortion . . . quenching takes place within the furnace structure, by means of a vertically operated elevator. Heated charges are never exposed to the air . . . as would be the case if work had to be transferred from the heating chamber to a separate quench tank. Uniform case depth is assured because each charge automatically remains at heat the same length of time.

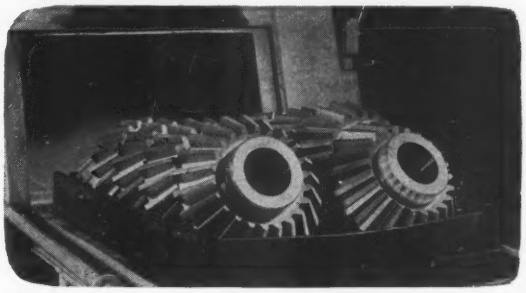
Preheat and purge chamber . . . Prior to entering the furnace heating chamber, work enters area immediately above built-in quench tank. Here, work is preheated . . . this reduces drastic temperature change when work enters heating chamber. Also, the work is completely purged while it is preheating.

Many furnaces in one . . . Furnace atmosphere is provided by Lindberg "Hyen" endothermic atmosphere generator that is easily adjustable to supply different atmospheres not only for carbonitriding, but also for carburizing, carbon restoration, bright hardening or annealing and normalizing. For annealing and normalizing the heated charge cools in the same chamber used for preheating and purging.

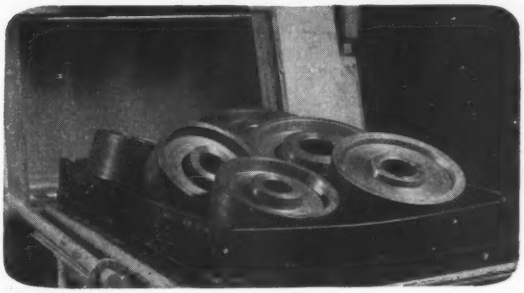
For additional information write your nearest Lindberg office . . . or Lindberg Engineering Company, 2441 West Hubbard Street, Chicago 12, Illinois.



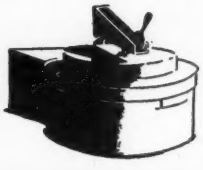
CARBONITRIDING . . . Specifications called for .023 to .025" case on these low carbon seamless tubes. The charge weighed 450 lbs., and required 1¾ hours.



CARBURIZING . . . 450 lbs. of these bevelled gears, SAE 1020, required three hours total time to obtain a .032" depth.

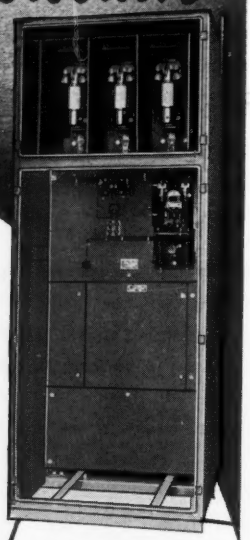


ANNEALING . . . These SAE 1045 gear blanks were annealed to 174 Brinell. Temperature was 1550° F., time 1½ hours. The charge weighed 350 lbs. Cooling was in atmosphere.

LINDBERG  FURNACES

CLARK HIGH VOLTAGE MOTOR STARTERS *insure* COMPLETE *Protection*

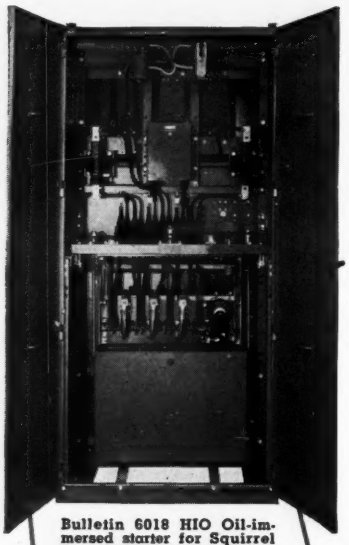
Standardized High Voltage Starters with either AIR-BREAK or OIL-IMMERSED line Contactors for squirrel-cage, synchronous and wound rotor motors up to 700 horsepower. Engineered and built to meet industrial and utility requirements.



Bulletin 6018 HIA Air Break Starter for Squirrel Cage Motors —front cover removed.

CLARK TYPE HIA AIR-BREAK STARTERS

CLARK High-Voltage Starters with AIR-BREAK heavy duty direct acting Contactors feature 150,000 KVA interrupting capacity disconnecting type fuses (2300 volt, 3 phase, 60 cycle)—overload and undervoltage protection—potential transformer with primary fuses for 220 volt control circuit.



Bulletin 6018 HIO Oil-immersed starter for Squirrel Cage Motors—Rear view with doors open and oil tank lowered, showing contactor

CLARK TYPE HIO OIL IMMERSED STARTERS

CLARK High-Voltage Starters with OIL-IMMERSED heavy duty direct acting Contactors feature 150,000 KVA interrupting capacity fuses for 2300 volts or 250,000 KVA fuses for 4160/4600 volts (3 phase, 60 cycle)—overload and undervoltage protection—potential transformer with primary fuses for 220 volt control circuit.

All CLARK High-Voltage Starters are enclosed in standardized reinforced steel cubicles with separate compartments for High and Low voltage equipment. Electrically interlocked doors. General Purpose, Semi dust-tight, Weather Resisting and Dust-tight enclosures available.

Please contact us for complete details covering the many features of these standardized High Voltage Starters. Offices in principal cities.

THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1146 EAST 152ND STREET, CLEVELAND 10, OHIO

BULLARD

MANUFACTURERS OF MACHINE TOOLS

Golden Gate Bridge, San Francisco, California

San Francisco Chamber of Commerce Photo

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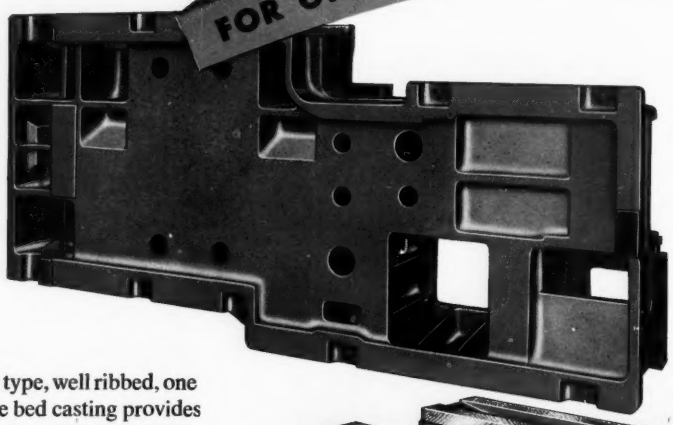
THE BULLARD COMPANY

BRIDGEPORT 2

CONNECTICUT

★ *For greater manufacturing economy*
REFER to next page

BULLARD MACHINE TOOLS
FOR GREATER MANUFACTURING ECONOMY



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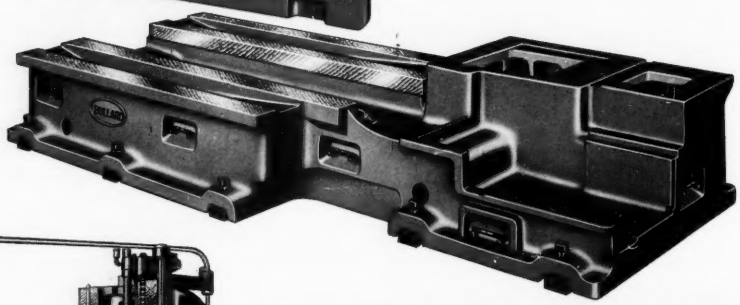

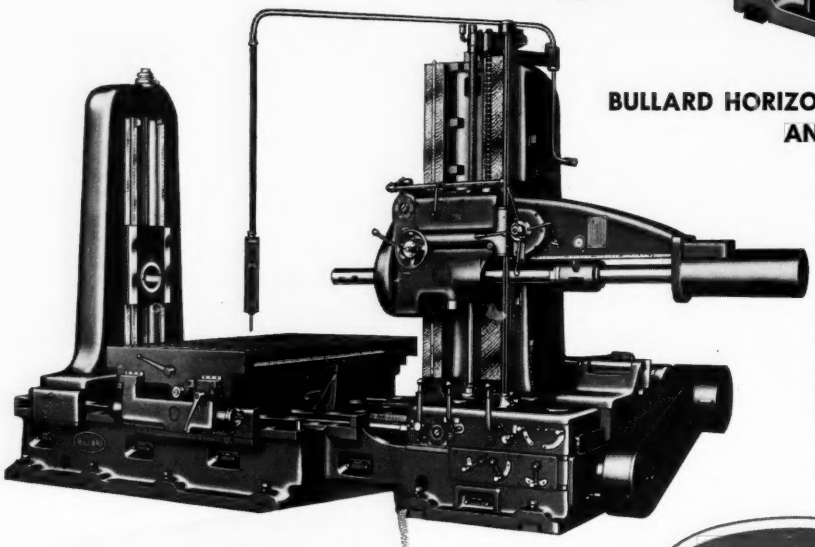

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are built with 4″ or 5″ spindles. A choice of three — table sizes, bed lengths and post heights. A full range of 48 feeds from .0002″ to 1.550″ and 24 speeds 8 to 1000 R.P.M. on 4″, and 7 to 850 R.P.M. on 5″ machines. Hydrodynamic coupling on main drive with brake motor. Convenient right-hand control and many safety features.

Write for complete information on 4″ and 5″ Spindle size Bullard Horizontal Boring, Milling and Drilling Machines.

BULLARD

THE BULLARD COMPANY

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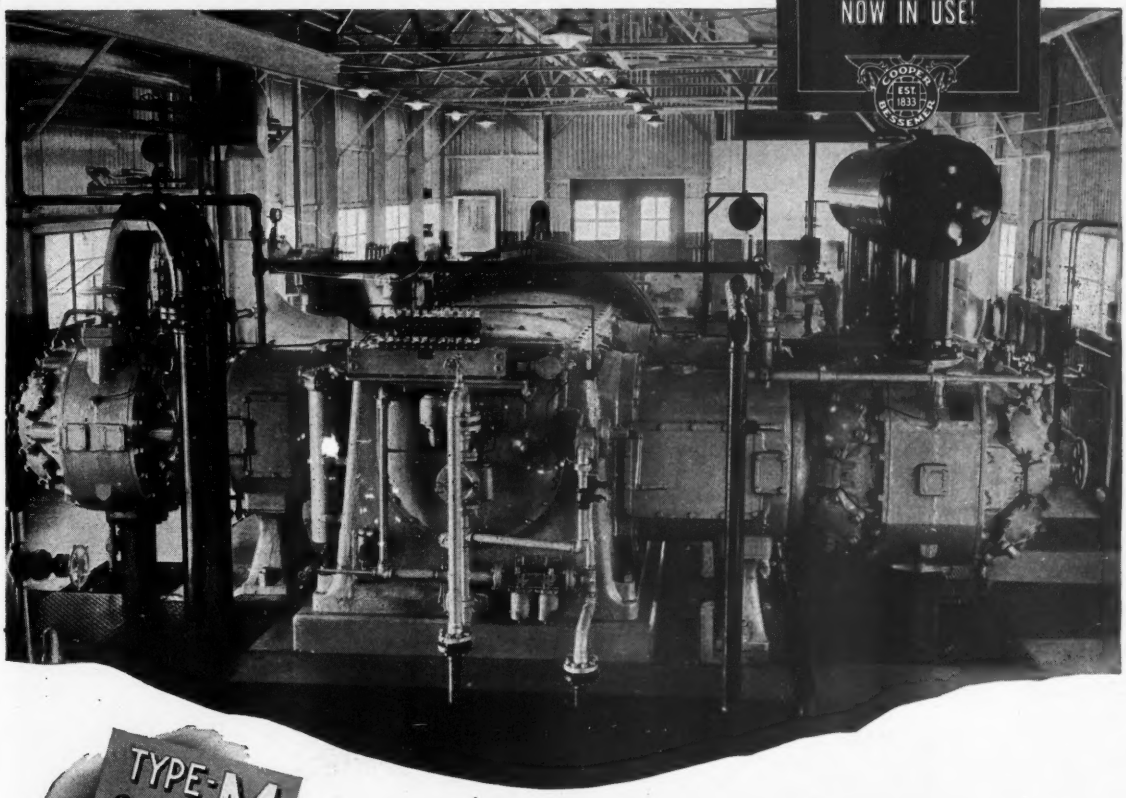
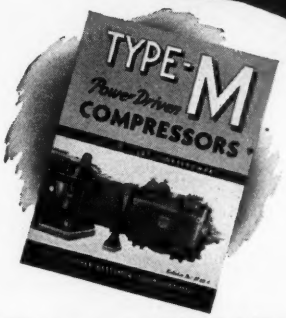
Cooper-Bessemer Compressors

Thousands speak louder than words!

Over 6 million Cooper-Bessemer Compressor Horsepower NOW IN USE!





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GAS permits precise AUTOMATIC temperature control essential to Wire Rope Manufacture

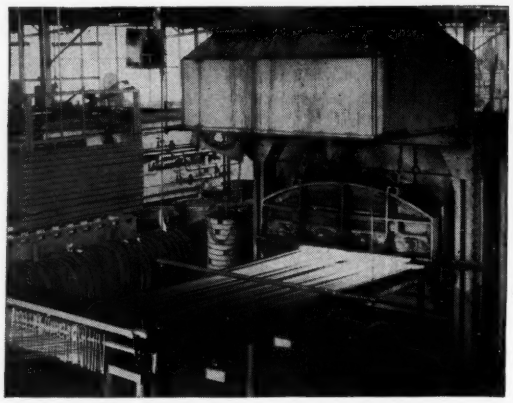
at UNION WIRE ROPE CORPORATION, KANSAS CITY, MISSOURI

GAS
THE MODERN FUEL
FOR ALL INDUSTRY

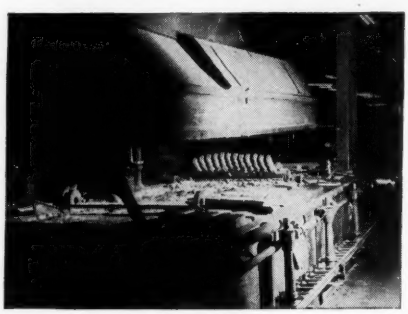
Union Wire Rope Corporation, Kansas City, Missouri, produces a full line of high carbon wire and wire rope, and provides the special wire rope used for oil and gas well drilling. Production is carefully controlled from start to finish, and many of the processes utilize the productive flames of Gas.

Gas patenting furnaces ready the rods for drawing through dies. Modern Industrial Gas Equipment provides the hot dip bath. Gas is an indispensable fuel in industrial applications because Modern Gas Equipment allows precision control of temperatures automatically, because Gas is clean, economical, and can be easily integrated into a production-line process.

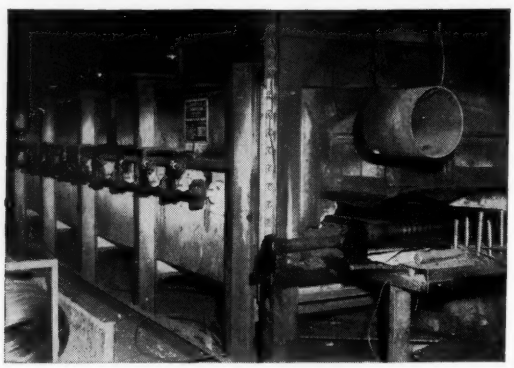
Whatever your production problems, you can rely on GAS for heat-treating and heat-processing. Get the facts today, from your Gas Company Representative.



Gas-fired patenting furnaces at Union Wire Rope Corp. provide the exact temperatures required to produce desired metallurgical properties in steel rods prior to drawing.



Gas-fired hot dip galvanizing bath for rope wire is under full automatic temperature control.



Rods passing through patenting furnace acquire a metallurgical structure suitable for drawing. The accuracy of temperature control vital to this process is readily obtained with Modern Industrial Gas Equipment.

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Coefficient of expansion practically identical with steel. Interchangeable with steel gage blocks and steel parts.

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Less than half the weight of tungsten carbide, approximately same weight as steel blocks.

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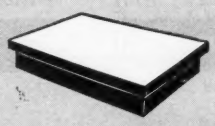
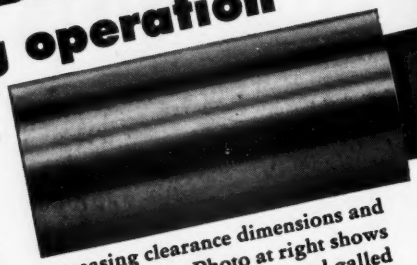

SURFACE PLATES

MONOLITES

MOBILE INSPECTION UNITS

OPTICAL FLATS

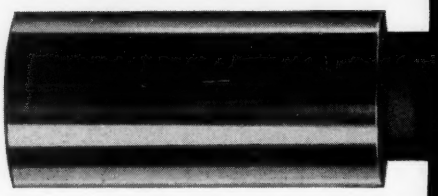
how SURFACE DEFECTS impair bearing operation



No matter how smooth a ground surface may appear, examination will reveal imperfections in the form of grinder scratches and ridges, feed spirals, chatter marks and partially loosened metal splinters. Upon contact, these minute peaks and ripples interlock with the mating surface of the bearing, tending to rupture the protective oil film. Fragmented metal is torn from surfaces to mix with lubricant and cause abrasive wear, increasing clearance dimensions and shortening life. Photo at right shows an example of a scratched and galled surface which stopped rotation by "plowing" metal.

how SUPERFINISH insures bearing life

Superfinish removes all surface defects such as grit scratches, feed spirals and the soft "smear metal" caused by grinding heat, and having removed the faulty layer—gets down to metal of the desired structure and hardness. At the same time, it produces a more nearly perfect geometrical form which supports a more efficient oil film for lubrication. There are no projecting defects to churn the oil film or cause metallic contact.

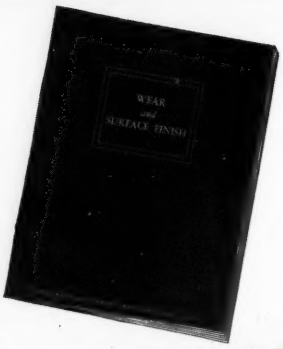


Load carrying capacity is substantially increased by Superfinishing. And bearing life is greatly prolonged.

you should know the facts about SUPERFINISHING!

It may surprise you to know what a quick and inexpensive process Superfinishing really is. It can greatly reduce the cost of grinding and, in many cases, eliminate such expensive operations as hand lapping and polishing.

If you have not yet read the booklet "Wear and Surface Finish," we will be glad to send you a copy of this authoritative text book with our compliments. Please request it on your company letterhead.



GISHOLT MACHINE COMPANY
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THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

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He is technically qualified to help you select the equipment exactly suited to your D.C. needs.

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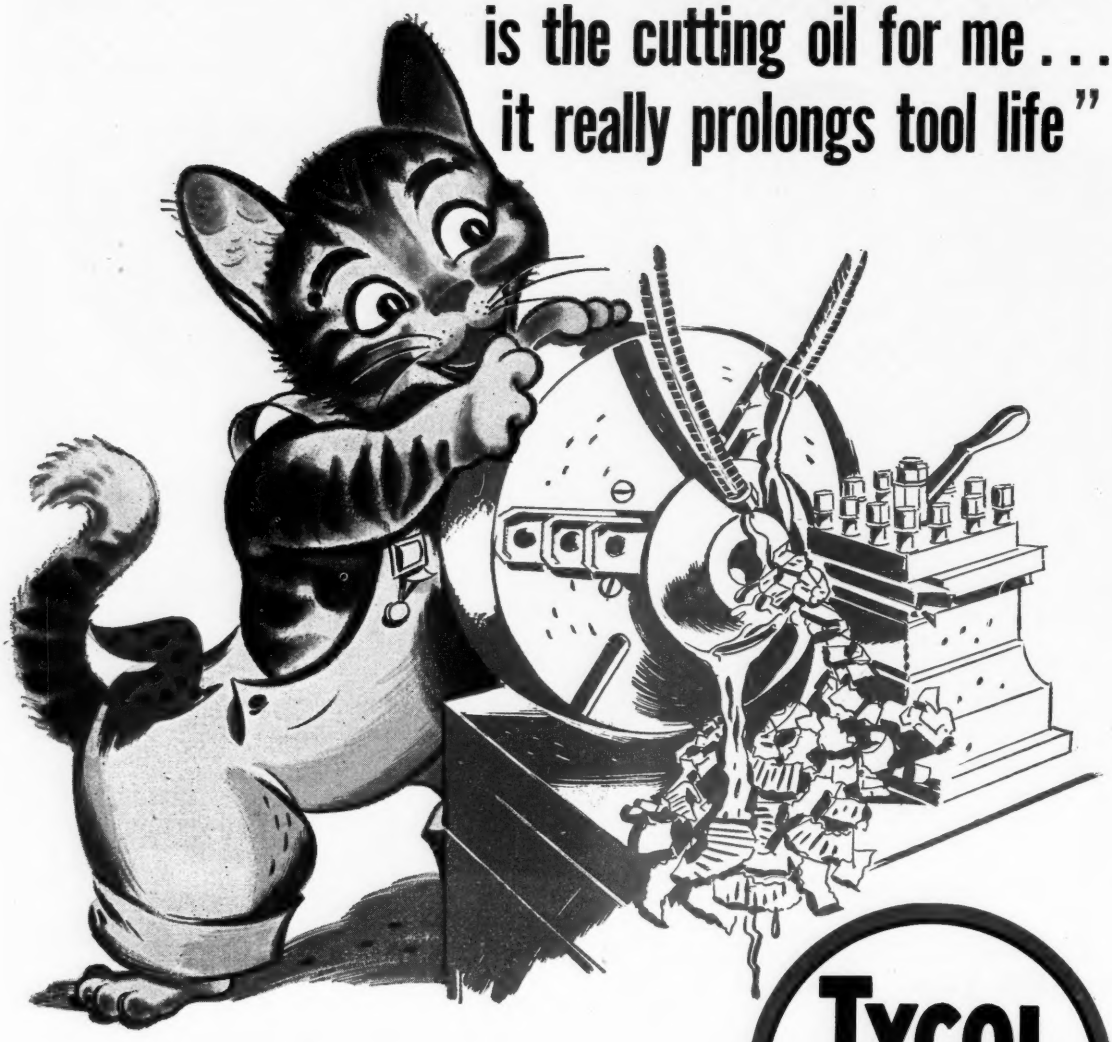
"Tycol Amulkut is the cutting oil for me . . . it really prolongs tool life"



That's 100% correct! Tycol Amulkut Cutting Oil speeds up production by permitting freer, faster cutting . . . assures uniformly finer finishes. It also cuts cost by reducing spoilage, and prolonging tool life . . . regrindings are few and far between.

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Now! TOCCO* Induction Melting Furnaces for Precision Casting

One of the TOCCO Induction Melting Furnaces used at Arwood Precision Casting Co. Note TOCCO control station in background.

● Engineers at Arwood Precision Casting Co. use TOCCO Induction Melting Furnaces for melting and remelting quality steel. Other companies have found TOCCO equally adaptable for melting non-ferrous metals. No wonder! *Look at the advantages:*

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- ★ Extremely Rapid Melting
- ★ High Efficiency on Intermittent Operation
- ★ Good Mixing because of Natural Agitation
- ★ Extremely Low Alloy Loss
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If any of these advantages suggest economies in your operations write for full details—no obligation, of course.

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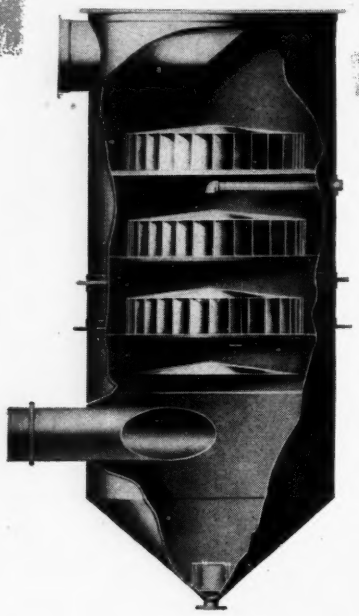

A dust collector of this design was constructed entirely from 14-gage HASTELLOY *alloy B sheet to resist severe corrosive conditions.*

Handling...

Hydrochloric Acid Vapors
Sulphuric Acid Mist
Nitrous Oxide
Chlorobenzol
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Three HASTELLOY alloy B dust collectors have just completed 2 years' steady service handling these corrosive chemicals. They are used in a large chemical plant to wash reaction gases and to reclaim many valuable chemicals.

HASTELLOY alloy B has excellent resistance to hydrochloric acid in all concentrations, even to the boiling points. It also has good resistance to sulphuric acid and many other chemicals. The alloy can be fabricated into practically any type of chemical equipment.

For information on the resistance HASTELLOY alloy B has shown to many corrosive media and on fabrication procedures, write for a copy of "HASTELLOY High-Strength, Nickel-Base, Corrosion-Resistant Alloys."

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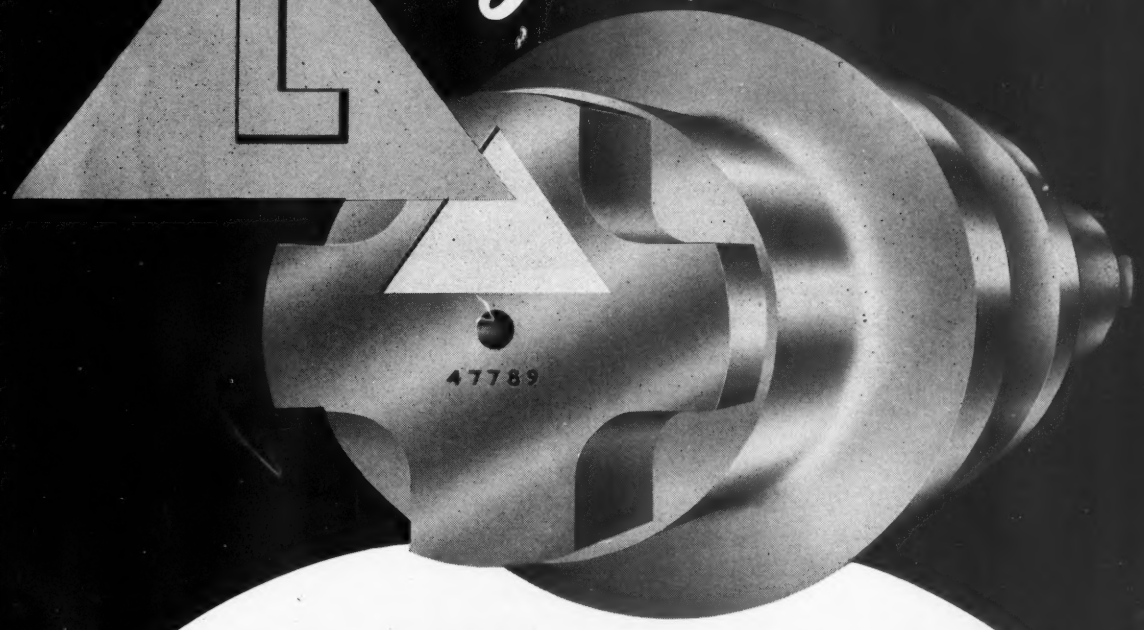

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"803" • Mueller Brass Co. "803" metal is a high silicon iron-copper bronze that is ideally suited for many difficult applications in jet aircraft. "803" metal has unusually good machinability, and it is extremely ductile. It is non-galling and has excellent mechanical properties at temperatures up to 500°F., factors that account for its wide use as roller bearing cages and other specialty parts in jet engines.

"600" SERIES • "600" series are high strength bearing bronzes that do not contain any hard-to-get tin. They can be forged into relatively complicated shapes that are closer to size and require less machining than sand castings. "600" series metals have a low coefficient of friction and a tensile strength 2½ times that of the cast phosphor bronzes. They are highly resistant to wear and corrosion. These properties make "600" series highly desirable for use as parts on hydraulic equipment, actuators and instruments in jet aircraft. "600" series metals are available in standard or special extruded shapes up to 12' mill lengths. There is a "600" series alloy to suit your special bearing metal needs.

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For complete information about "803" metal, the "600" series alloys and TUF-STUF, write today to

82

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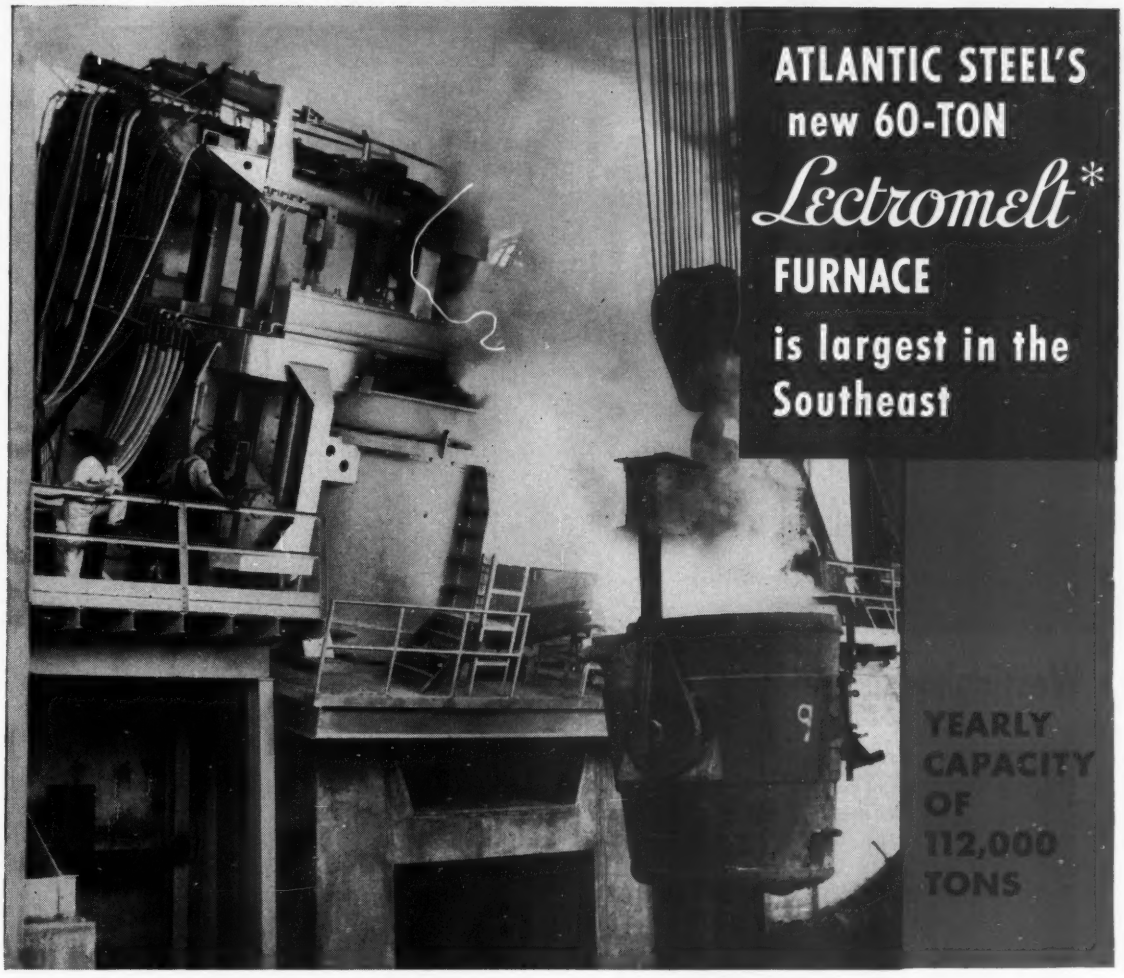

W. E. Moore, inventor of the Moore Rapid Lectromelt* Furnace, was among the celebrities who witnessed the first official pouring of metal here at Atlantic Steel Company, Atlanta, Georgia. The furnace is this company's first electric furnace, and the largest of its kind in the Southeast.

The "JT" Lectromelt Furnace has an 18-foot shell diameter, is rated at 60 tons, but is capable of producing 75 tons of steel ingots per-heat. It has timesaving and laborsaving top-charging.

If you're interested in furnaces for melting, refining, smelting or reduction, write for Catalog No. 8, Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh 30, Pennsylvania.

Manufactured in...CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2... ENGLAND: Birlec, Ltd., Birmingham... AUSTRALIA: Birlec, Ltd., Sydney... FRANCE: Stein et Roubaix, Paris... BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege... SPAIN: General Electrica Espanola, Bilbao... ITALY: Forni Stein, Genoa.

*REG. T. M. U. S. PAT. OFF.

MOORE RAPID

WHEN YOU MELT... *Lectromelt*

WHICH OF THESE HEAT-TREATING PROBLEMS IS YOURS?

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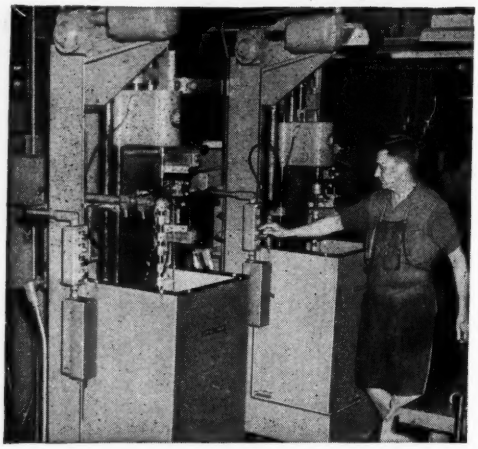
Westinghouse induction heating helped Saco-Lowell solve all six



Saco-Lowell Shops, makers of outstanding textile machinery, had always experienced problems with hardened bottom front rolls.

A Westinghouse 50 KW-450 KC RF Generator, with two standard vertical scanners, helped increase line production rates by 145% with total annual savings of $18,800.00. Direct labor costs have been cut 63%. Journal bearings are now ground after hardening, producing a higher quality roll. Formerly, every shaft required straightening; now this operation has been simplified and costs are reduced 70%.

Look at the results obtained by Saco-Lowell with a Westinghouse process that can handle 432 different rolls. Examine your heat treating problems. They, too, may be reduced, clarified, or eliminated entirely.

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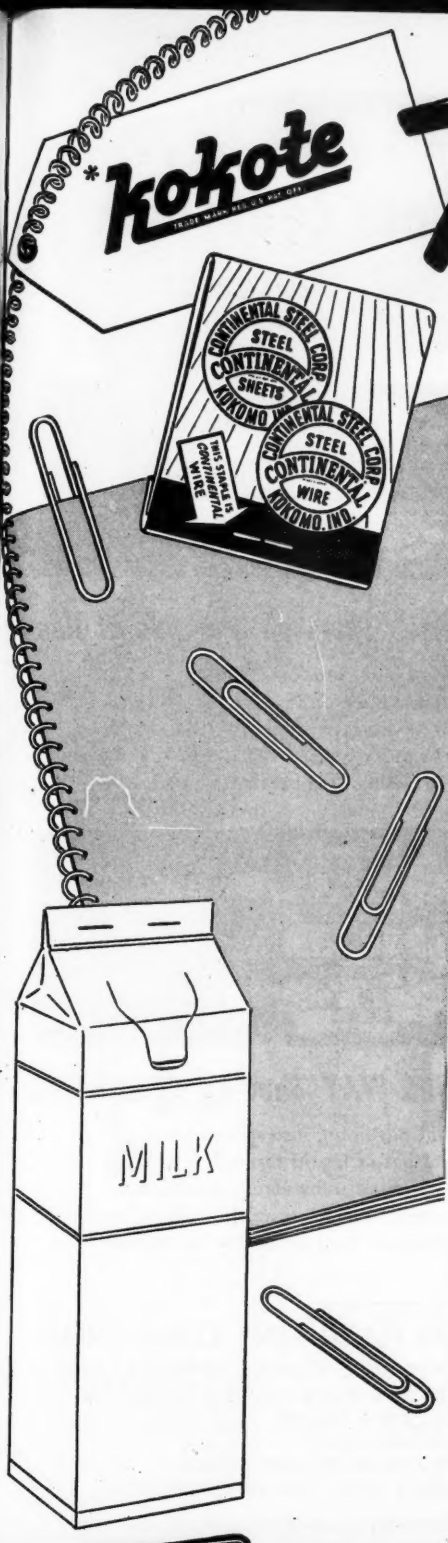
Westinghouse

INDUCTION HEATING



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IN ANY WIRE-BUYER'S BOOK

● Kokote just can't be beat . . . when it comes to brightness. It's a wire that's "different" from furnace to finish. Bright and lustrous as polished silver, Continental Kokote lends its chrome-like lustre to a wide variety of finished products. Our customers use it for spiral bindings, paper clips, match book staples and on milk cartons. There are a host of other uses for this flexible bright wire. And with Kokote, as with any Continental wire, users get Continental follow-through wire service. It's a basic Continental policy that the wire must be right for your particular product application—or it's made right. Write Continental at Kokomo, Indiana.

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QUICK CONNECTIVE SHUT-OFF COUPLINGS

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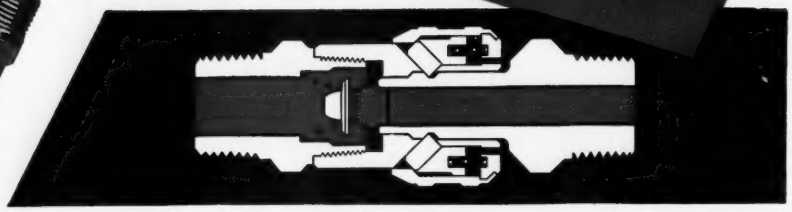
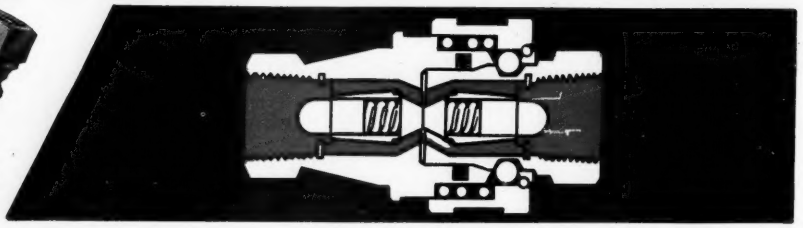


HANSEN PUSH-TITE COUPLING
Cross-section at upper right shows flow through coupling when connected.

HANSEN *PUSH*-TITE COUPLING *Shuts off one side of line*

Hansen Push-Tite Couplings give you quick connection and disconnection, with instant automatic flow or shut-off. To connect coupling, and open line to flow of fluid, you merely push plug into socket. To disconnect, a slight pull on sleeve releases plug and shuts off supply end of line. Free swiveling plug prevents hose kinks.



HANSEN SERIES HK
Shuts off both ends of line when disconnected.

HANSEN *HIGH-PRESSURE 2-WAY Shut-off* COUPLING

To connect, merely pull back sleeve and push plug into socket. Identical torpedo type valves permit free flow of gas or liquid through coupling. To disconnect, just pull back sleeve—coupling immediately disconnects, valves automatically and instantly seal both ends of line. Can be mounted to disconnect automatically where fluid lines may be subject to sudden, damaging strain.

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9" diameter, 3-colors

CRUCIBLE first name in special purpose steels

52 years of Fine steelmaking

TOOL STEELS

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PROTECT YOUR BEARINGS with KLOZURE* OIL SEALS!

There's a model designed for every bearing application

GENERAL PURPOSE

MODEL NO.		APPLICATION
63		Normal and high-speed service.
53		Normal and high-speed service.
51		Medium-speed rotary service, low pressure and reciprocating service.
64		Large shafts operating under severe service.
65		Heavy-duty service at moderate speeds.

SPECIAL PURPOSE

MODEL NO.		APPLICATION
54		Sealing spherical surface on self-aligning or spherical bearings.
142		Sealing plane surface perpendicular to axis of the shaft.
SPLIT KLOZURE		For installation without disassembly of equipment.
11		Medium-speed service against heavy lubricants and mild dust conditions.

DUAL TYPE

MODEL NO.		APPLICATION
R-1		Medium-speed double-duty service.
R-2		Medium-speed double-duty service where liquids are present on both sides of seal.
TF		Medium-speed service. Two sealing elements in tandem.
TB		Medium-speed service where abrasive conditions are severe.
T-2		Medium-speed service where minimum leakage is of great importance.
F-1		Medium-speed service where dirt conditions are severe.

METRIC SIZES

MODEL NO.	APPLICATION
63 - 53 51 - 65	For press fit into standard International millimeter ball and roller bearing housings.

TEMPERATURES ABOVE 300° F.

SPECIAL MODELS	APPLICATION
Klozures with Silicone sealing elements can be furnished in most Klozure Model numbers.	Excessive temperature service due to actual operating temperature or generated heat on very high-speed shafts.

FOR LIMITED SPACE

MODEL NO.		APPLICATION
71B		Normal and high-speed service where liquid lubricants are to be contained.
91B		Normal and high-speed service and to accommodate large housing bore variations.
71A		Springless Klozure where heavy lubricants are to be contained and dirt is to be excluded.
91A		Springless Klozure for low-speed service and to accommodate large housing bore variations.
71A7		Springless Klozure for low-speed service on tapered roller bearings requiring clearance for bearing cone.

EXTERNAL TYPE

MODEL NO.		APPLICATION
111		Medium-speed rotary service, low pressure and reciprocating service.
113		Normal and high-speed service.
123		

For detailed information write for Klozure Catalog No. 10.

*Registered Trademark

THE GARLOCK PACKING COMPANY, PALMYRA, N. Y.
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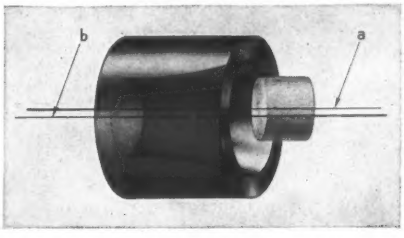
GARLOCK

PACKINGS, GASKETS, OIL SEALS,
MECHANICAL SEALS,
RUBBER EXPANSION JOINTS

What's in Vermont this month?

To grind a taper, the internal grinder must be set up according to simple geometric principles; that is, the path of the grinding wheel must be a straight line and must intersect the axis of the workpiece at a point. In the illustration, the axis of the wheel path "a" and the axis of the work "b" lie in parallel planes. The axes cross, but fail to intersect. Under these conditions, it is impossible to grind a true taper. As the grinding wheel enters the large end of the taper, the point of contact is high. This end of the taper can be ground to size. As the wheel progresses through the hole, the contact moves even higher, with the result that the hole will be progressively oversize and a curve is generated instead of a uniform taper.

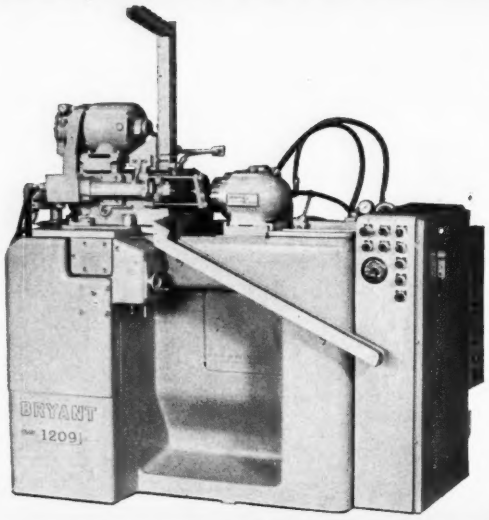
A taper ground under these conditions probably will blue only in the middle. Turning the work-head may shift this plug contact but, as the wheel wears, the plug contact will continue to move. The only possible remedy is to correct the alignment of the wheel path axis "a" and the work



axis "b" so that they intersect, then a uniform taper will be generated. In shop practice the adjustment would be made by bringing the wheel and work to exactly the same center height.

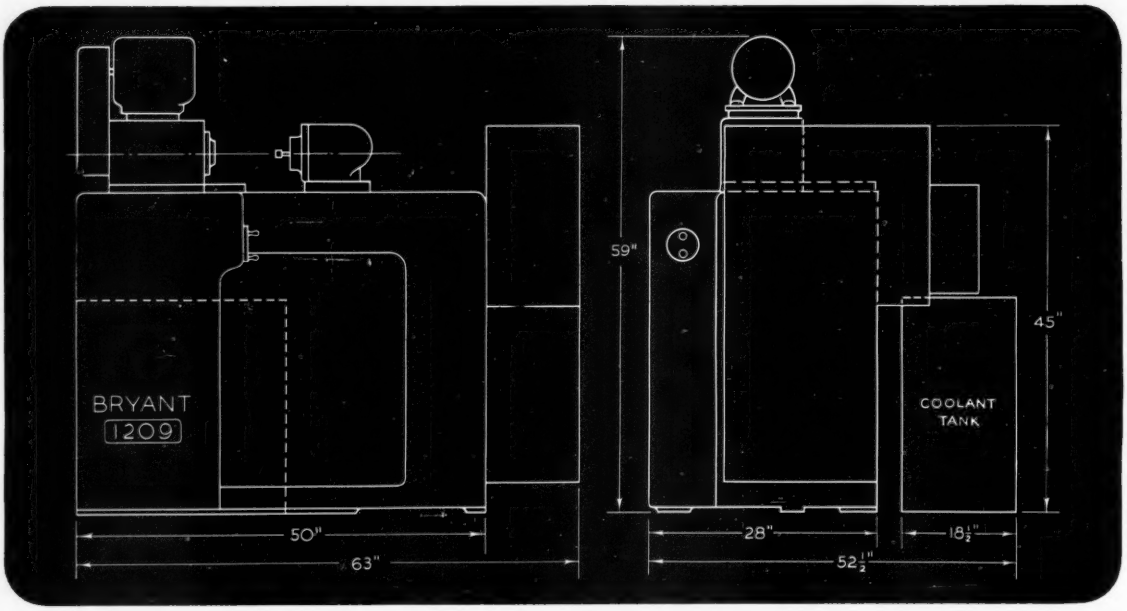
Bryant Chucking Grinder Company in Springfield, Vermont, U.S.A.

FOR HOLE GRINDING

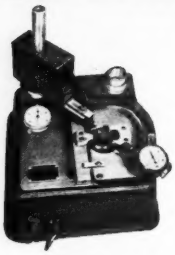


The Bryant 1209 Automatic Hole Grinder

This machine is designed particularly for high production, precision grinding of bores from ¼" to 3" in ball bearing races, gears, rolls, bushings, etc. Operator merely loads work, trips a valve to start cycle, and unloads the finished piece. The machine automatically *rough grinds, finish grinds and returns to chucking position when finish size is reached.* Hydraulic control, with individual throttles, gives infinitely variable control for each phase of the grinding cycle. The work spindle and cross feeds are driven by independent D. C. motors, giving infinite speeds and feeds with dial control. Wheel speeds up to 100,000 R.P.M. are obtained with the Bryant Hi-Frequency Wheelhead. Write for folder.



FOR CHECKING SQUARENESS OF UNDER-FACE



Bryant Thread Gage with Squareness-of-under-face Attachment

When an under-face must be checked square with an external thread, the part should be held on the thread flank and rotated in this position. The Bryant Gage does this, regardless of variation in roundness, P.D., lead or thread form. The attachment can be adjusted to check the under-face of any part which can be held in the gage. Illustrated is the No. 2 gage with a range from 1" P.D. to 2⅛" P.D. Simultaneous readings can be made — the attachment shows face run-out — the Bryant Thread Gage checks thread size — *giving accumulated reading of P.D., form and lead on dial indicator 4 to 5 times faster than plug gaging!* Send for folder.

Bryant Chucking Grinder Company in Springfield, Vermont, U.S.A.

It's new Curtis

MODEL 98 AIR COMPRESSOR
Two Stage Air Cooled 15 and 20 Horse Power

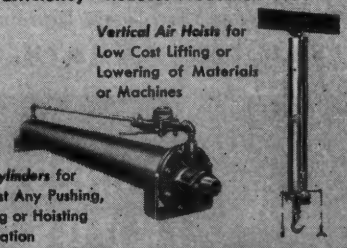
designed to give you even greater dependability lower cost operation longer life

Features that make the number 98 compressor truly outstanding:

1. Two-Cylinder Compressor — less friction and less oil consumption
2. Vibration Free — smooth operation
3. Self Oiling by positive Centro-ring method
4. Timken Main Bearings — provide easy external adjustment
5. Four section Finned Intercooler — effective cooling between stages
6. Valves readily removable as assembled units
7. Precison Built — assures long life and minimum maintenance
8. Experience backed by 98 years of "Know-How"
9. Also furnished in both base and tank mounted units

Mail coupon for additional information

Other CURTIS Equipment that Increases Plant Efficiency—Reduces Production Costs



Vertical Air Hoists for Low Cost Lifting or Lowering of Materials or Machines

Air Cylinders for Almost Any Pushing, Pulling or Hoisting Operation

CURTIS PNEUMATIC MACHINERY DIVISION
of Curtis Manufacturing Company
1996 Kienlen Ave., St. Louis 20, Mo.

I am interested in items checked below:

☐ THE NEW MODEL 98 AIR COMPRESSOR ☐ VERTICAL HOISTS ☐ AIR CYLINDERS

Name.....

Firm.....

Street.....

City.....Zone.....State.....

Other Curtis Compressors available in sizes from ¼ to 50 horsepower inclusive.

CURTIS PNEUMATIC MACHINERY DIVISION of Curtis Manufacturing Company

1996 Kienlen Avenue St. Louis 20, Missouri

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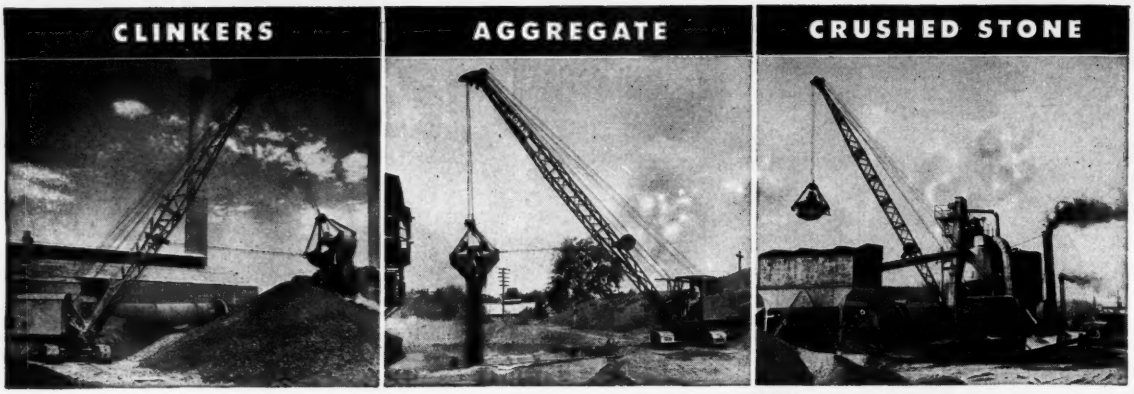
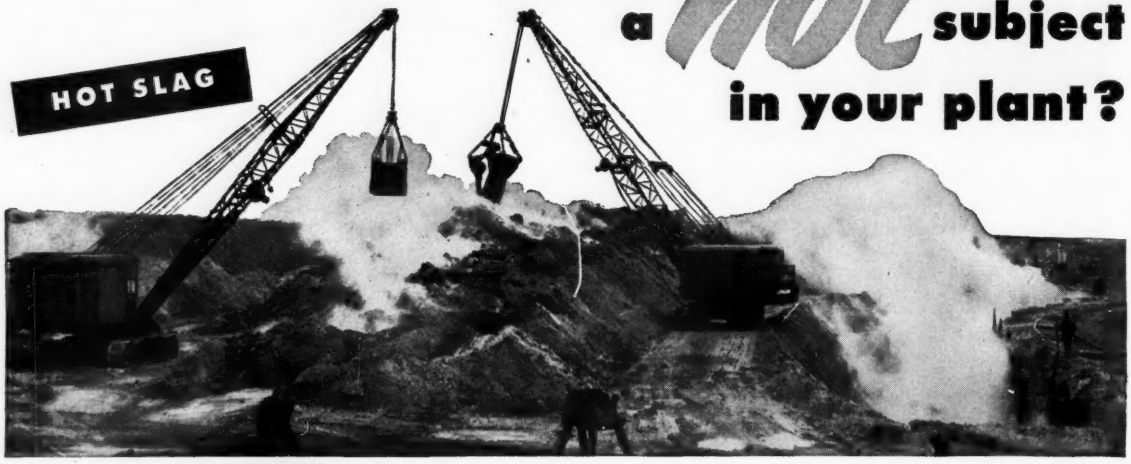
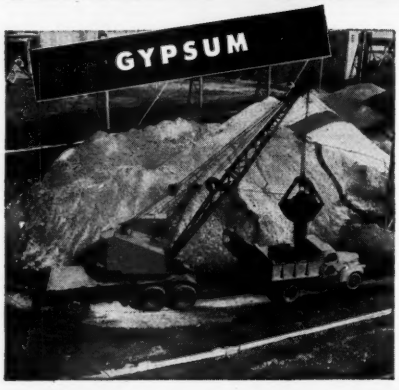


is BULK material handling a *hot* subject in your plant?





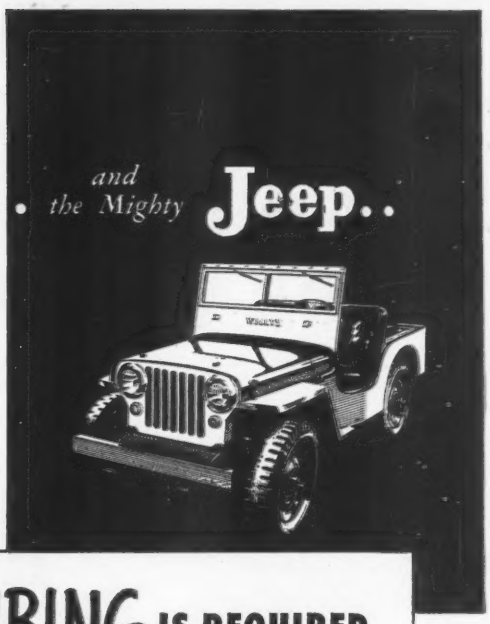
■ Bulk materials . . . are they a problem in your plant? You can solve that problem with a Lorain as these plants and many, many others are doing every day. Regardless of the type of material, the terrain or the travel needs, a Lorain as crane, clamshell, dragline, shovel or hoe can handle the job. What's more, all booms and front ends are easily interchangeable. This means more *different* jobs can be handled—the Lorain kept busy—costs lowered—on the handling of bulk materials, components or finished products, and, as an extra bonus, with a Lorain you get help for those maintenance and construction jobs that constantly crop up around a plant. There is a cost-cutting Lorain for any material handling job—in capacities up to 45 tons—on crawlers or rubber tires—and with advanced design and construction features that are the result of 52 years of leadership in the shovel-crane field. "Take the heat off" your material handling problem. Get the full facts from your Thew-Lorain Distributor today.

THE THEW SHOVEL CO., LORAIN, OHIO

THEW **LORAIN**® CRANES FOR INDUSTRY

IN THE MANUFACTURE OF

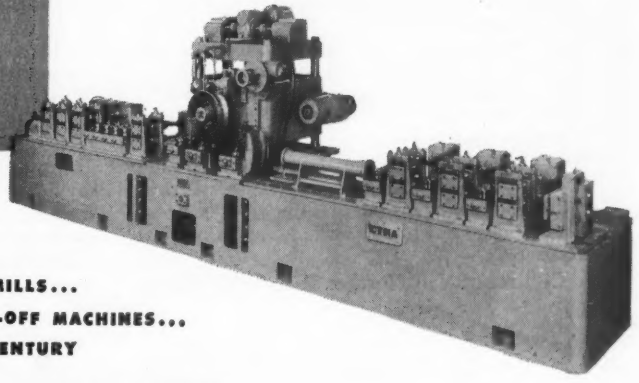
The New **Aero Willys....** *and the Mighty* **Jeep..**



MILE AFTER MILE OF STEEL TUBING IS REQUIRED

ETNA TUBE MILLS HELP DO THE JOB

Regardless of the type of tubing you require, there is an Etna Resistance-Weld Tube Mill suited to your requirements. Etna invites comparison of their mills with any other on the market. For faster, more uniform production of steel tubing, regardless of finish or end use, consult Etna engineers. Etna mills are designed to meet your individual requirements.

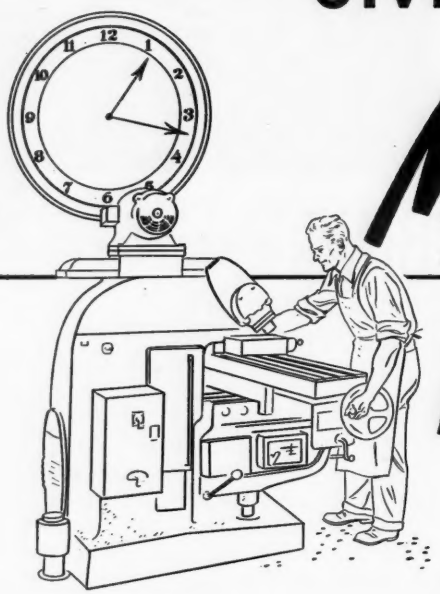


MANUFACTURERS OF HEAVY DUTY TUBE MILLS...
SWAGING MACHINES...TUBE CUT-OFF MACHINES...
FOR MORE THAN HALF A CENTURY

THE ETNA MACHINE CO.

3400 MAPLEWOOD AVE. TOLEDO 10, OHIO

VAN NORMAN
RAM-TYPE MILLERS
GIVE YOU



More Work per Man Hours!

More work per man hour . . . that is exactly what you get in every one of the six basic models of Van Norman Ram-Type Millers. Your operators can turn out more and better work because they have so much less preliminary, error-charged fussing to do . . . because it is so much easier to set up these machines . . . and to control them when they are in operation.

Set-up time is saved by combining the adjustments of the cutterheads and rams to take successive cuts from horizontal to vertical milling. This means you get the greatest number of pieces per hour, produced with highest accuracy.

Control of Van Norman Ram-Type Millers is simplified by grouping the operating levers right at the operator's fingertips. Accuracy is safeguarded by the massive, rigid construction . . . especially in the large and heavy table, knee and saddle assemblies . . . by extra-heavy spindle transmission . . . and dials that are large enough to be plainly and easily read.

And remember, accuracy is underwritten in each machine by Van Norman's 61-year tradition of high-precision manufacturing . . . by the full measure of quality in every mechanical feature, including weight and rigidity for smooth operation and heavy cuts.

That's why . . . when you buy Van Norman Ram-Type milling machines . . . you buy results.

VAN NORMAN

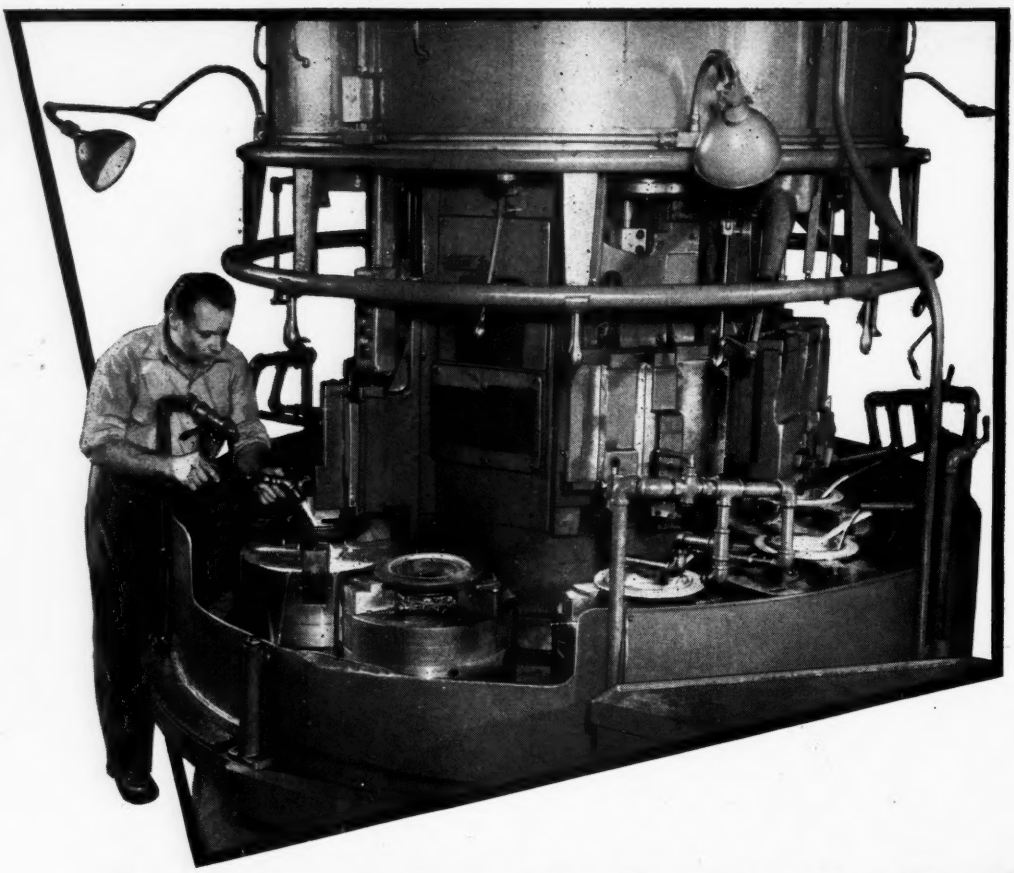
SPRINGFIELD,

SPECIFICATIONS for No. 38

- Plain and Universal
- Table: 64" x 14"
- Range: 35" Longitudinal; 12" Cross; 22¼" Vertical
- Spindle Drive Motor: 10 HP

COMPANY

MASSACHUSETTS, U. S. A.



Quantity Production . . .

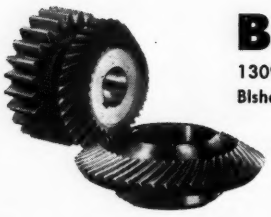
• Quantity production of identical gears offers a challenge that we here at BRAD FOOTE are eager to accept.

• Multiple spindle machines, duplicate machines, numerous and varied machines, every machine that's needed—PLUS men of long experience making close tolerance gears . . . these factors make it possible for us to confidently accept such a challenge.

• When you specify BRAD FOOTE gears, you do so with the knowledge that each gear will be made to exact specifications; that every gear of a quantity will be identical in structure, in size, and in appearance; that each operation on every gear will be performed by BRAD FOOTE people in BRAD FOOTE shops. No one will share our responsibility.

• You will be satisfied with the BRAD FOOTE gears you buy because they will give long, economical service on the equipment you operate, or on the machines you sell to others.

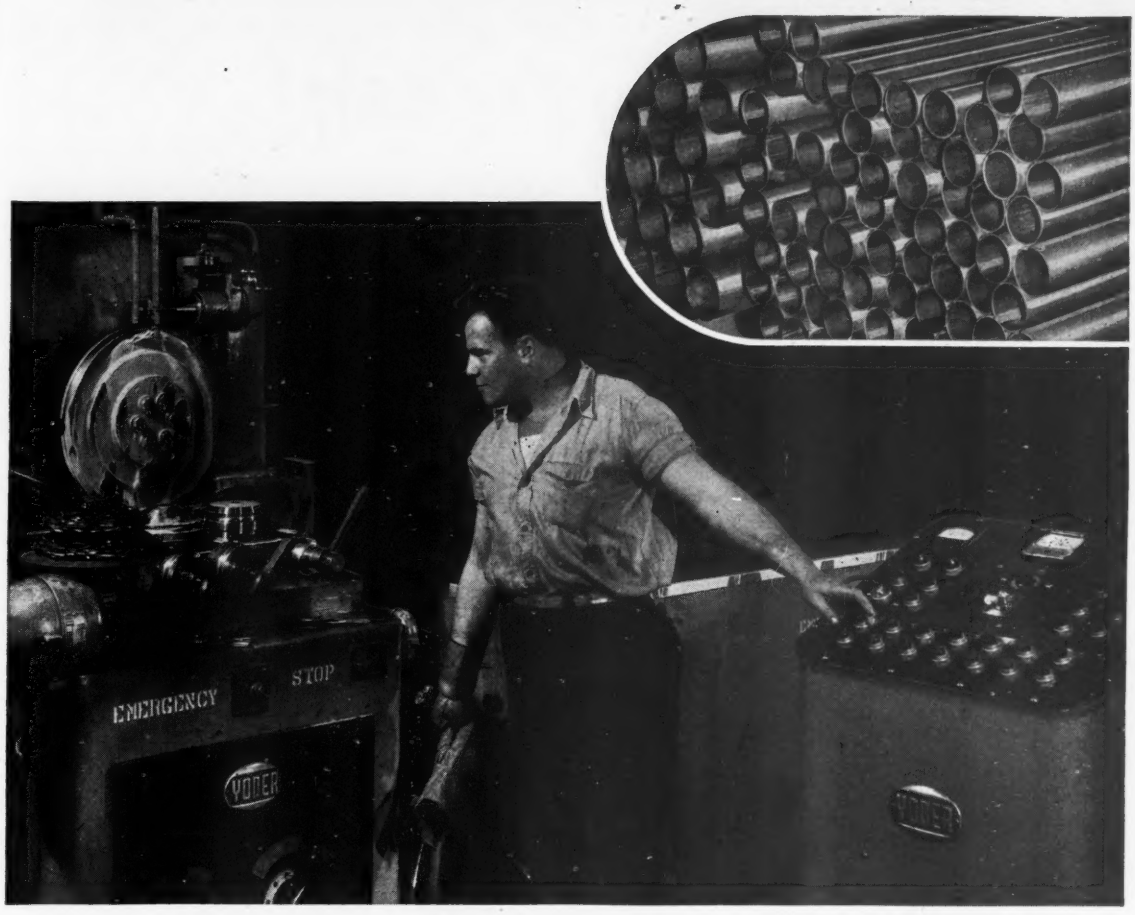
• Your inquiries are invited.



BRAD FOOTE GEAR WORKS, INC.

1309 South Cicero Avenue • Cicero 50, Illinois
Bishop 2-1070 • OLympic 2-7700

subsidiaries | AMERICAN GEAR & MFG. CO. • Phone: Lemont 920 • Lemont, Illinois | PITTSBURGH GEAR COMPANY • Phone: ATlantic 1-9950 • Pittsburgh 22, Pennsylvania



Thinking of making PIPE OR TUBING?

In 1938, total U.S.A. production of electric-weld pipe and tubing was only 269,000 tons. But in that year, Yoder brought out a line of cold-roll-forming tube mills, equipped with their revolutionary new electric-resistance welder.

According to the latest available figures, U.S.A. production of electric welded pipe and tubing in 1950 was nearly 3,500,000 tons, a growth of 1300% in 12 short years.

Much of this growth was due to the advantages of the cold-forming, electric-weld process in general, and to the excellence of Yoder Tube mills in particular, because most such mills installed since 1938 have been built by Yoder.

With the new multiple cross-type welding transformer and other recent Yoder developments, Yoder mills now offer higher speeds and greater production than ever. If you have been thinking of making pipe or tubing, get the latest information on Yoder mills—yours for the asking.

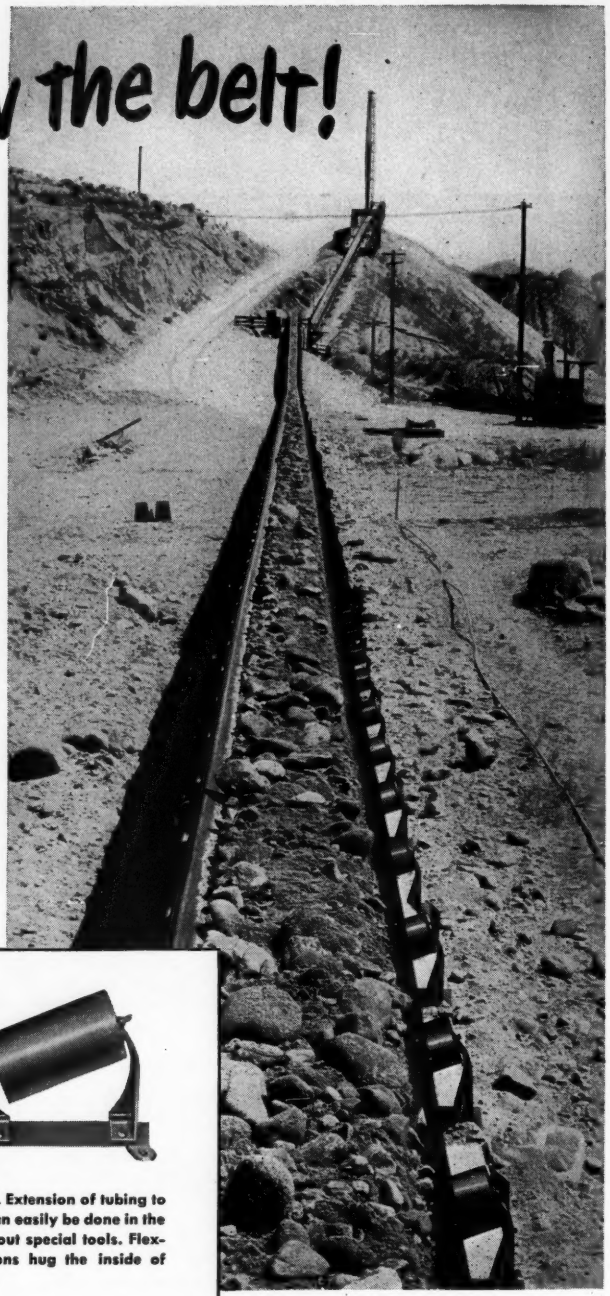
THE YODER COMPANY • 5502 Walworth Avenue, Cleveland 2, Ohio

Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding

ENGINEERING YODER MANUFACTURING

a big "hit" below the belt!



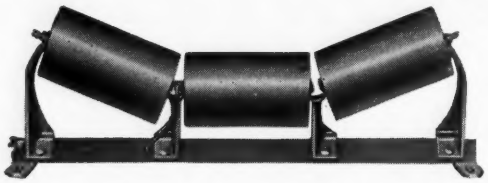
Nearly everyone realizes the advantages of belt conveyors for low-cost transportation of bulk materials. But what goes on below the belt is, perhaps, too often taken for granted. Certainly, the belt idler, more than any other piece of equipment, is responsible for the low cost of belt conveying per ton of material handled.

That's why Rex® Idlers are so often specified. Rex has been the leader in idler design and construction for over 25 years and sets the standard that others are working toward.

An idler must "keep rolling." If it freezes up, the belt will quickly wear through the roll, leaving sharp edges to cut your belt. The most common causes of idler "freeze-ups" are grit and dirt entering the bearings and build-up of material underneath the roll. To keep your Rex Idlers rolling, all you have to do is *keep your deck plates clean.* This will prevent material from building up on the rolls. The Rex Triple Labyrinth Grease Seal does the rest. The grease is there only to keep out dirt and grit, not to lubricate. With the special Rex seal design, the grease stays in . . . the dust stays out.

Remember, your idlers are the backbone of your entire belt conveyor. Don't gamble. Insist on Rex and be sure of a trouble-free performance year after year. For all the facts call your nearest Chain Belt Field Sales Engineer or write for Bulletin 51-81.

Chain Belt Company, 4660 W. Greenfield Avenue, Milwaukee 1, Wisconsin.



For over 25 years Rex Idlers have been recognized as leaders in the field of idler design. Now Rex again leads the way with the flexible grease line. Note the accessible, protected location of the fitting. Extension of tubing to far side can easily be done in the field without special tools. Flexible sections hug the inside of the base.

CHAIN BELT REX COMPANY ®

Chain Belt COMPANY OF MILWAUKEE

Atlanta • Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland
Dallas • Denver • Detroit • El Paso • Houston • Indianapolis • Jacksonville
Kansas City • Los Angeles • Louisville • Midland, Texas • Milwaukee • Minneapolis
New York • Philadelphia • Pittsburgh • Portland, Oregon • Springfield, Mass.
St. Louis • Salt Lake City • San Francisco • Seattle • Tulsa • Worcester

Distributors located in principal cities in the United States and abroad

Only P&H AC Welders have this feature

for faster, easier, sounder welds on non-ferrous and "hard-to-weld" metals

No other welder has this Instantaneous Control feature. Foot-operated, the control provides the heat you call for instantly, *electrically* — not mechanically. No time lag. It's a P&H exclusive that boosts production, cuts costs, saves time.

Inert Gas Welding

Instantaneous control lets you handle "hard-to-weld" metals with ease — aluminum, magnesium, brass, copper, stainless, high carbon, high alloy, and low carbon steels. You get sound welds — X-ray quality every time. No burn-throughs, fewer rejections.

Operators like it, too. It gives them faster, better welds in only five simple steps. Check them:

1. Foot switch automatically turns on power, high frequency, water and gas.
2. Arc starts *instantly* without touching work.
3. Foot switch control provides exact heat needed *while* welding — *no time lag.*
4. Foot-operated control cuts power either gradually or instantly at completion of weld. Eliminates craters — no scrap pieces needed to run out bead.
5. Gas and water shut off automatically according to pre-set time delay.

Compare AC Inert Gas Welders, point by point, and you'll buy P&H. Check these outstanding features:

- **P&H Dial-lectric Control** — No moving coils or cores to bind or freeze. Maintenance is absolutely negligible.
- **Built-in high frequency unit** — eliminates additional external equipment. Variable frequency control.
- **Automatic gas and water control** — Pre-set automatic time delay control (2 seconds to 2 minutes) prevents electrode contamination, assures clean, sound welds.
- **Stepless amperage regulation** — from 10 amps to maximum. Three models available — ranges 200, 300 and 500 amps.
- **Unusual arc stability** — Makes good clean welds where extremely low amperages are required.
- **Selector switch** — gives operator instant choice of standard or high frequency unit.

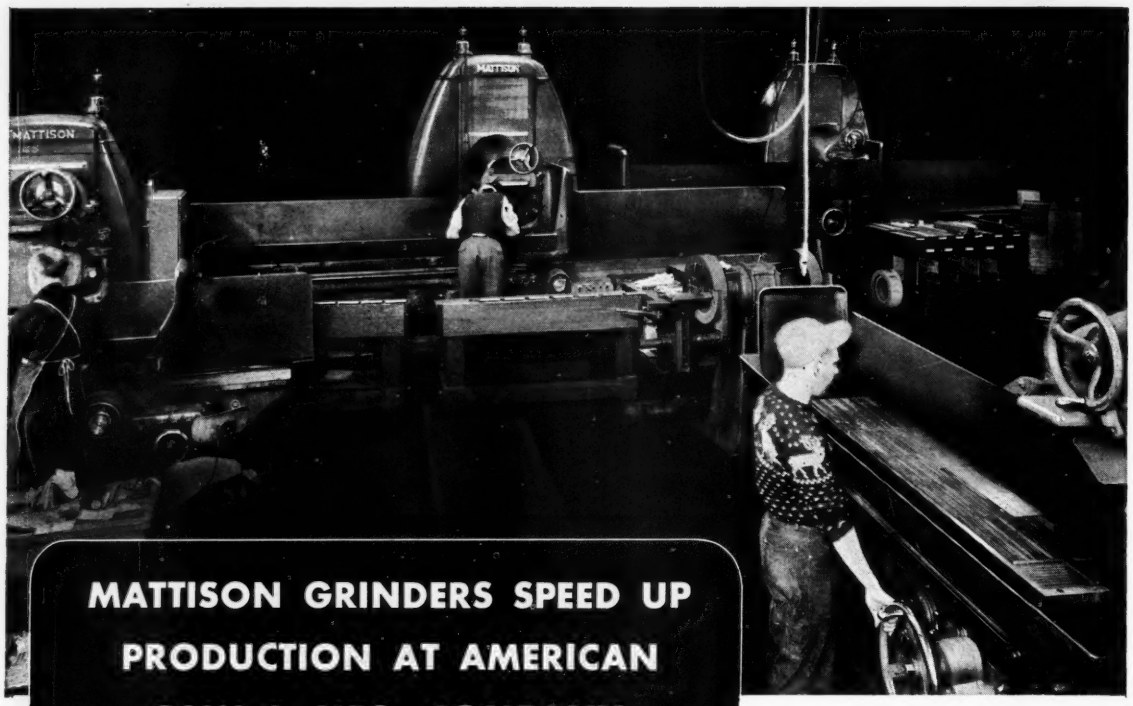
No wonder P&H Inert Gas Welders are the choice of the aircraft industries where top quality work and speed are "musts". They join "hard-to-weld" metals faster and easier — eliminate rejects for you, too. Get full details from your P&H representative or write us for further information.

P&H

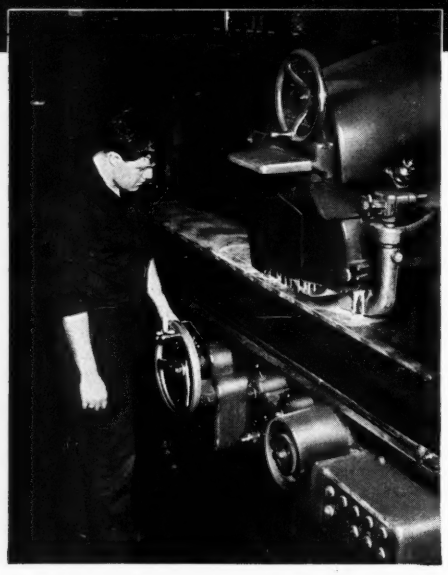
WELDING DIVISION
HARNISCHFEGER CORPORATION
4411 WEST NATIONAL AVE. • MILWAUKEE 14, WISCONSIN

2426

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES



MATTISON GRINDERS SPEED UP PRODUCTION AT AMERICAN SAW & MFG. COMPANY



● The four Mattison High Powered Precision Surface Grinders shown above are used by American Saw & Mfg. Company for the grinding of annealed tool steel strips and bars on a real production basis in the manufacture of Lenox Precision-Master Ground Flat Stock. Exacting manufacturing specifications demand excellent finishes within close limits of accuracy.

The massive double column support, high power and rigidity of construction of the Mattison Grinder combine with accuracy and speed of operation to insure consistent precision results on a high production basis for American Saw & Mfg. Company. For complete information regarding the capabilities of the Mattison High Powered Precision Surface Grinder send for free circular.

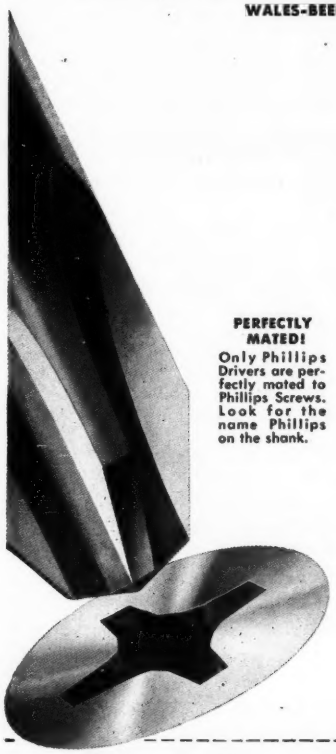
MATTISON MACHINE WORKS

ROCKFORD · ILLINOIS

Q.

Which of these 23 firms can reduce your costs— increase your sales?

AMERICAN SCREW CO. • ATLANTIC SCREW WORKS, INC
THE BLAKE & JOHNSON CO. • CAMCAR SCREW & MFG. CORP.
CENTRAL SCREW CO. • CONTINENTAL SCREW CO.
THE EAGLE LOCK CO. • ELCO TOOL AND SCREW CORP.
GREAT LAKES SCREW CORP. • THE H. M. HARPER CO.
THE LAMSON & SESSIONS CO. • NATIONAL LOCK CO.
THE NATIONAL SCREW & MFG. CO. • PARKER-KALON CORP.
PHEOLL MFG. CO. • ROCKFORD SCREW PRODUCTS CO.
SCOVILL MFG. CO. • SHAKEPROOF INC.
SOUTHERN SCREW COMPANY • THE SOUTHINGTON HDWE. MFG. CO.
STERLING BOLT CO. • STRONGHOLD SCREW PRODUCTS, INC.
WALES-BEECH CORP.



PERFECTLY MATED! Only Phillips Drivers are perfectly mated to Phillips Screws. Look for the name Phillips on the shank.

A. *All of them . . . because all of them make Phillips Cross-Recessed-Head Screws*

Your customers recognize these nationally advertised fasteners as the clue to quality. Millions of readers of The SATURDAY EVENING POST are being constantly reminded that "X marks the spot." So, they're looking for Phillips Screws on the products they buy. That means extra sales for you.

And that's not all. You save time, work, and money with Phillips Wood, Machine, Tapping Screws or "Sems." They save up to 50% driving time, set up tighter, reduce damage due to slippage. Use them more . . . and get more sales.

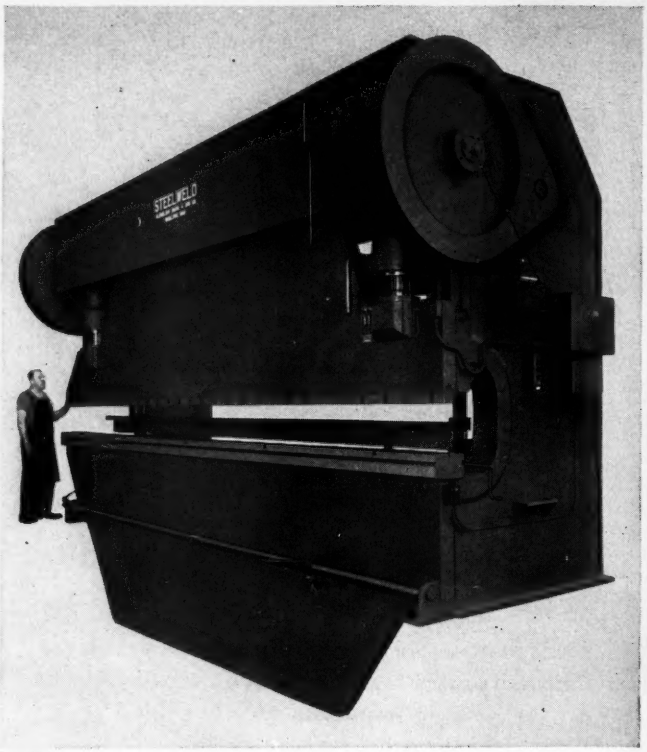
X marks the spot . . . the mark of extra quality

PHILLIPS *Cross-Recessed-Head* SCREWS

As Advertised in The Saturday Evening POST

THE FASTENERS OF TODAY . . . AND OF THE FUTURE

Easy Operating Versatile Presses



Model J4½-16. Length of bed and ram is 19'-0". Because of distance between housings, the bed is extended below floor to assure straight accurate bends.

Model H-3½-8. Handles plate up to 10'-¼". Gauges and indicators provided, make it a simple matter to obtain identical results repeatedly, with a set of dies.

These bending presses are as easy operating as they are modern in appearance. They are versatile tools that are quickly adapted to various bending, corrugating, punching and forming operations.

The complete line of Steelwelds is built to withstand heavy brunts to which presses are occasionally subjected. Every machine is generously designed throughout. Each has tremendous power, enabling the ram to carry through smoothly and easily. The husky brake-clutch mechanism stops the ram nearly instantly or permits it being jogged in minute amounts.

If you work with plate in any thickness up to 1¼ inch or length up to 20 feet, you too, like hundreds of present users, may find it possible to speed production, cut costs and enhance your product appearance with modern Steelweld Presses.

GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

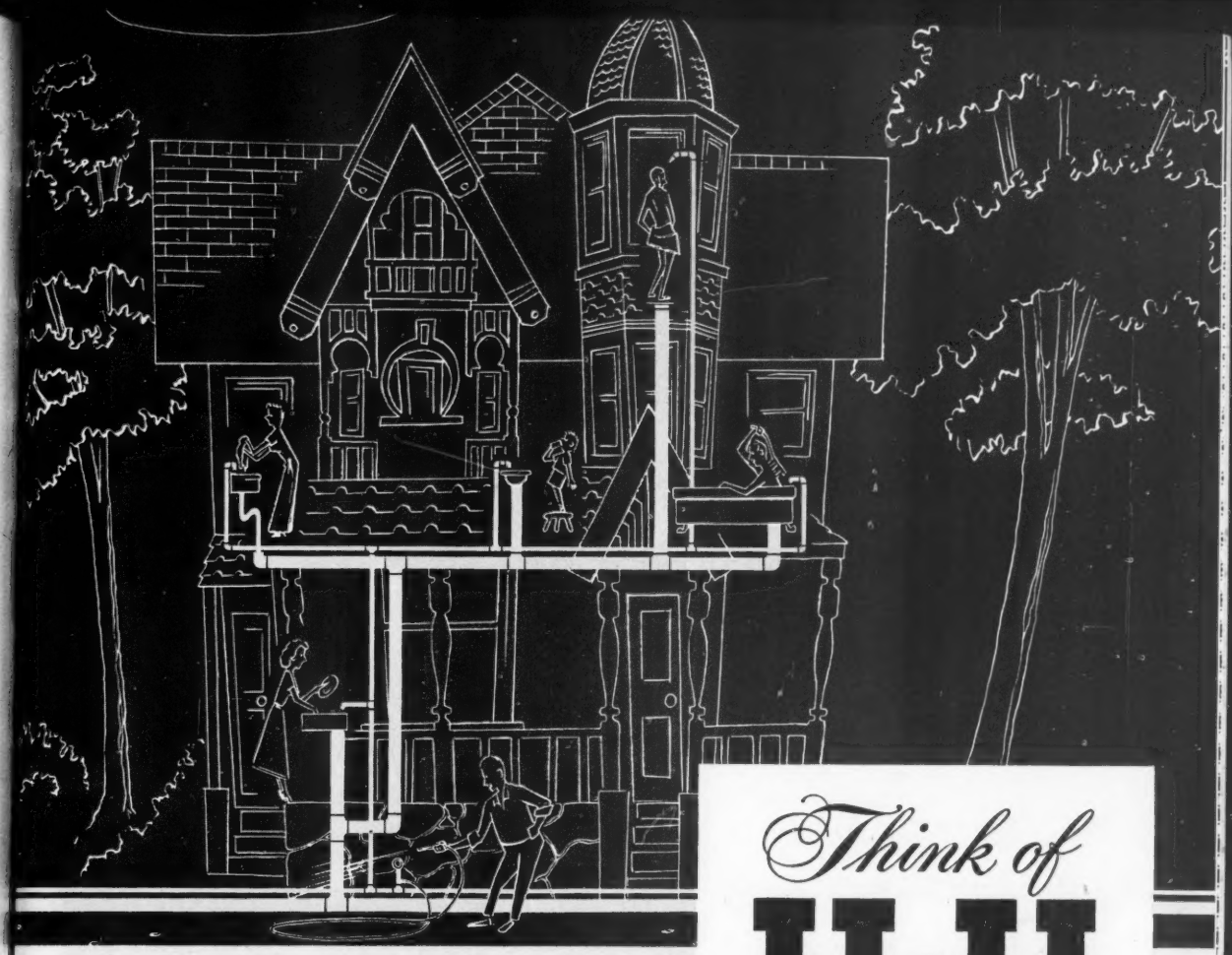
THE CLEVELAND CRANE & ENGINEERING CO.

7844 East 281st Street, Wickliffe, Ohio

STEELWELD

BENDING PRESSES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING



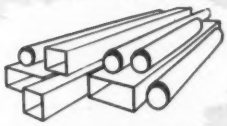
Think of

H&H

First

For Brass and Copper Tubing that will LAST...

EVERYWHERE you go, you'll see H & H brass and copper tubing and fabricated parts—in homes, in motors and machines, in heating and refrigeration equipment, even in the automobile you drive. H & H straight length tubing like the type shown at the right has long been used for plumbing in homes where quality and long life count. In fact, the H & H seamless copper water tube installed today will render faithful service for generations to come. So if you want tubing that will *last*, be sure to think of H & H *first*. The H & H man in your area will be glad to tell you why.

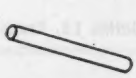


20-FOOT STRAIGHT LENGTHS*
(SEAMLESS)

Available in sizes from ⅛" O.D. up to and including 1½" O.D. with wall thicknesses of .010" up to and including .065", in round, square or rectangular shapes; cut lengths up to and including 20 ft.

*Types K, L and M water tubing drawn in limited sizes. Prices upon request.

H&H TUBE AND MANUFACTURING COMPANY
255 North Forman Avenue, Detroit 17
Originators and sole makers of "Metalflo"—the economy tubing


METALFLO

LOCKSEAM

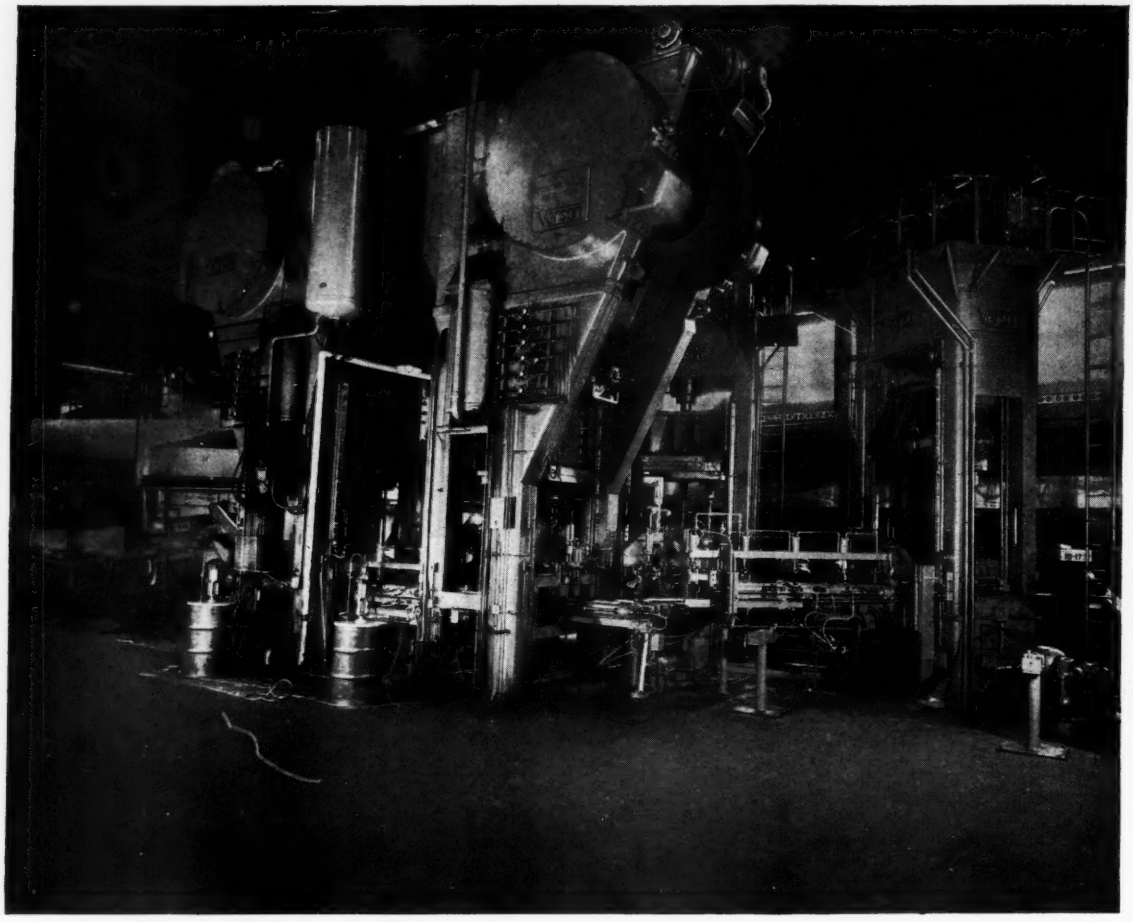
COIL STRIP AND

SEAMLESS TUBING

TUBULAR PARTS

THIS TRADE Verson MARK AUTOMATIC TOOL-UP

speeds production of large caliber projectiles



IN a tool-up developed by Verson and consisting of Verson presses and tooling, 90, 105 and 120 mm. projectiles are produced automatically from billet to finished forging. Production is increased 25% over previous methods; skilled manpower requirements are reduced substantially; material consumption is cut 15% resulting in big reductions in machining time. The tool-up incorporates conveyors for automatic handling between operations and automatic handling in the press.

This tool-up illustrates how Verson engineering can speed production and cut the cost of vitally needed defense materials. We will be pleased to send you additional information on this projectile tool-up or to discuss your needs with you. Write or phone, outlining the nature of your requirements.

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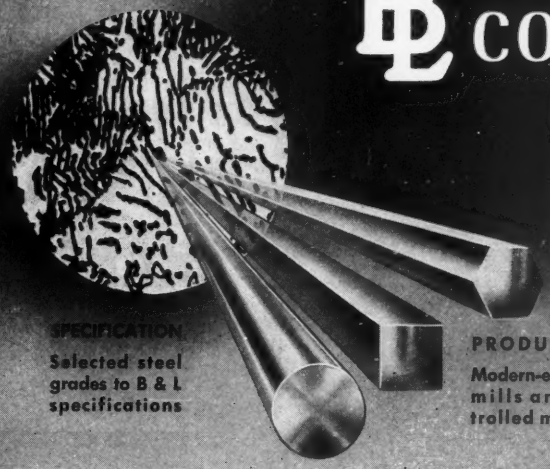
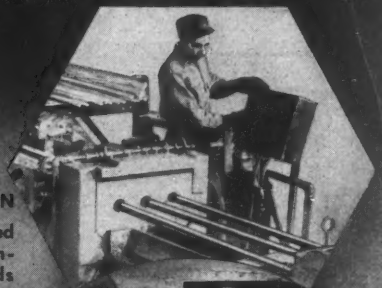
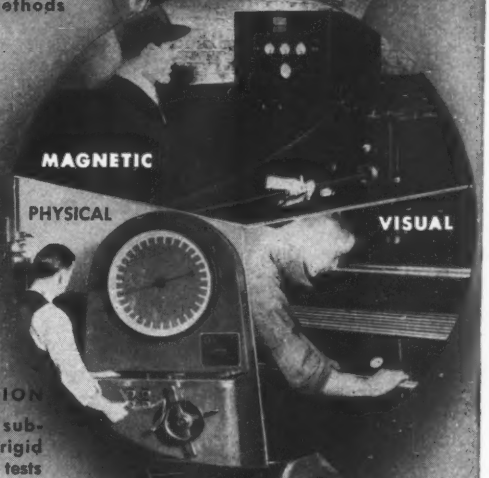
How MACHINABILITY-PLUS is developed in B&L COLD FINISHED BAR STEELS



SPECIFICATION
Selected steel grades to B & L specifications



PRODUCTION
Modern-equipped mills and controlled methods



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The production of B&L Free-Machining Steels is a quality-controlled operation, based on the know-how gained in three-score years of fine craftsmanship.

It is the sum total of selected steel bars and modern cold finishing processes that advances the machinability to new values which are rigidly maintained by B&L inspection standards.

These plus-machining qualities of B&L Cold Finished Bars will pay-off on your production line . . . specify them for extra output and low unit cost in parts fabrication.

Refer your machining problems to B&L engineers for selection of steel grades to fit your job.

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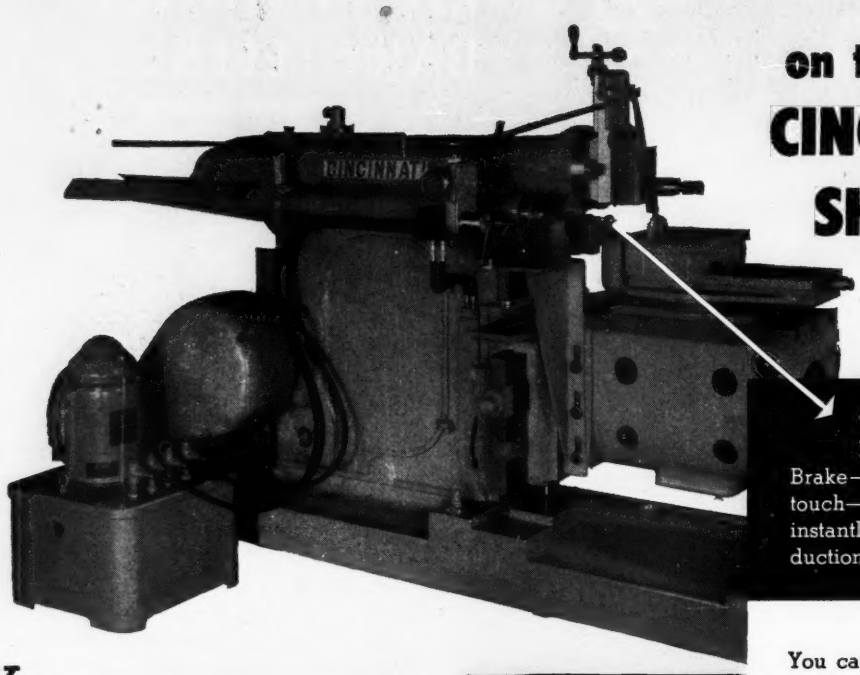
Do STANDARD SHAPING *and* AUTOMATIC DUPLICATING

on the *same* CINCINNATI SHAPER



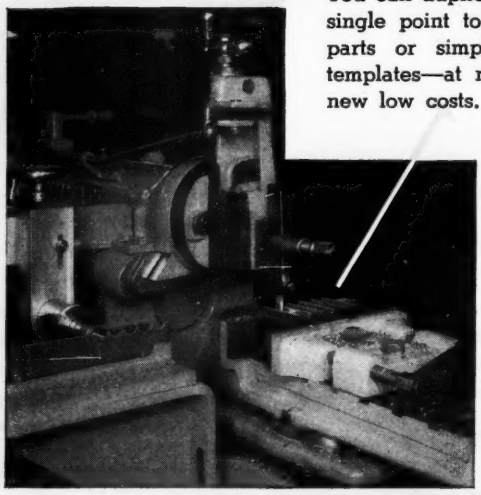
The powerful Cincinnati Magnetic Clutch and Brake—controlled with a finger touch—starts and stops the ram instantly, and speeds production.

YOU can change from Standard Shaping to Automatic Duplicating without a hitch on this hydraulic follower-equipped Cincinnati Shaper. The duplicating mechanism does not interfere with standard shaping operations.

The new Electro-Magnetic Clutch and Brake also brings greater ease of control and greater speed in operation.

A Cincinnati Shaper is the handy man of industry and will be versatile and profitable in your shop.

Write for Automatic Contour Duplicating Bulletin DN-1 and Catalog N-5.



You can duplicate parts with a single point tool, using actual parts or simple sheet metal templates—at new speeds and new low costs.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

The Metalworking Outlook

July 7, 1952

Enough for the Military?

Plans have been dropped to open struck steel plants to produce military steel. Mobilizers think that the capacity made available by those companies which have signed (p. 61) and those which were never struck will be enough to do the job. Pittsburgh Steel Co. and Copperweld Steel Co. signed when they accepted a modified union shop plan. At the middle of last week, U. S. Steel, Bethlehem, Republic, Jones & Laughlin, Youngstown Sheet & Tube and Inland reiterated their stand that they would not accept even the modified union shop plan.

Gyrations in Scrap

The steel strike is causing gyrations in the scrap market. Cast scrap prices, unsteady for some time, are firming because foundries are growing short of pig iron and so are using a greater proportion of cast scrap in their melts. The ore strike is causing increasing alarm among steel producers, and those that are open or can stock scrap are buying more heavily in anticipation of greater scrap needs this winter when ore stocks get perilously low because of inadequate shipments this summer.

Steel Deferred

In the fourth quarter most copper users will get about 50 per cent of their base period requirements of the red metal. Aluminum users will get 55 per cent of the base period needs. Those allocation decisions are contingent upon no labor troubles among either copper or aluminum producers. Serious walkouts are a possibility in copper (p. 62). Decisions on steel will not be made until the strike is over and the damage can be appraised.

Foot in the Door

Most of the amendments to the Defense Production Act probably will not greatly change the economic climate for metalworking firms immediately. But a couple of tricky little things may mean the foot-in-the-door that could bring big changes eventually. One is the exemption from salary control of professional engineers. Although the Salary Stabilization Board is already issuing interpretations saying the exemption applies to engineers only, the amendment could be the start in the undermining of all salary stabilization. Another amendment stipulates that the U.S. cannot enter into any International Materials Conference agreements unless American consumers are allowed to purchase the quantity of material allocated to other countries which the other countries aren't going to use. The effect of this could be to bid world prices up.

NPA Tightens Up

Watch for a new drive against violators of NPA regulations now that it's certain distribution controls won't be scrapped. Robert E. Winn, in charge of the agency's enforcement, says the steel strike multiplies compliance difficulties. Another problem which will get Mr. Winn's attention is the alleged violations of aluminum orders by some makers

Production-Engineering News—p. 89 *The Market Outlook—p. 155*

of storm windows. The Senate Small Business Committee is alarmed about that situation and is bringing pressure to bear on NPA.

Help for Small Business

The Navy and Army will soon follow the lead of the Air Force and earmark contracts for small business. That was President Truman's promise to Telford Taylor, Small Defense Plants Administrator, when Mr. Taylor went to the White House to complain. The Defense Department issued a directive some time ago providing special aids for small business. The Air Force put it into effect, but the other two services ducked the issue.

Boom in Electronics

Production in electronics is at a rate eight times that of the three months following the start of the Korean War. This year's annual production rate is $4 billion—$2.5 billion for the military, $1.5 billion for civilian radio and television production and manufacture of replacement parts. While supplies of third-quarter copper and aluminum for civilian electronics production is up, output will still be hampered by a scarcity of cobalt and nickel.

Aircraft Output: Climbing

Aircraft production is rising, will climb still higher in coming months. Production for the Air Force was 100 per cent of the schedule in May. Despite increased output which has been going up steadily for the past 18 months, airframe manufacturers find their profits declining. Their 1951 sales hit $1979.3 million, up 42.6 per cent from 1950. Net profits after taxes amounted to $30.9 million, less than half of the $62.5 million reported in 1950.

Straws in the Wind

National Security Resources Board will study recommendations of the Paley Materials Policy Commission and submit within 60 days proposals for carrying them out . . . Copperweld Steel Co. has developed a brake drum made of welded copper and steel for busses and trucks. . . . Highway construction will remain high for at least three years as a result of increased federal aid for roads, to $1385 million for fiscal 1954 and 1955 . . . Capital expenditures for the oil industry will top $4 billion in 1952 . . . The sixth quarterly report on defense production, the first one put out by Acting Defense Mobilizer John R. Steelman, contains little that's new . . . Development of malleable steel and composite steel-wood floors for gondolas may mean that bigger railroad cars can be built.

What Industry Is Doing

We will see many shutdowns by steel consumers even after steel companies start operations again (p. 61) . . . Makers of steel fasteners face another round of shortages (p. 63) . . . Worth of the 100 largest manufacturing corporations is assessed (p. 64) . . . Sales of materials handling equipment will rise (p. 65) . . . The wraps are off the new T-48 medium tank (p. 66).

No. 9A MARVEL
Production Saws
Capacity 10" x 10"

No. 6A MARVEL
Production Saws
Capacity 6" x 6"

Eight of these MARVEL 9A Saws have already earned *Service Stripes**

Eight of these high speed MARVEL Production Sawing Machines at the Accuracy Steel Cutting Company, Hazel Park, Michigan, (a suburb of Detroit) operated almost continuously thruout the last war—cut up thousands of 20 ft. bars into accurate slices, pieces and lengths, for war production.

Now with a battery of fifteen of these world's fastest hack saws, Accuracy Steel Cutting Company has immense capacity to put behind defense and civilian work.

MARVEL Production Saws will automatically cut bar stock to size at terrific speed . . . they will feed, measure and accurately cut-off identical pieces from single or nested bars *automatically*, with no more operator attention than a battery of automatic screw machines.

Versatile, as well as accurate and fast, these saws can be stopped at any point in a production run—a miscellaneous cut made —and production resumed by simply re-engaging the automatic bar push up.

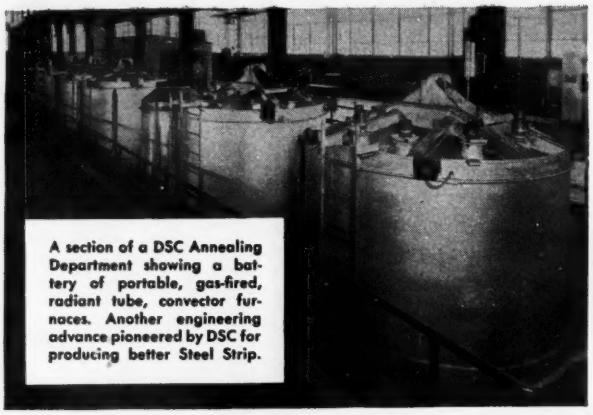
Write for Catalog

MARVEL *Metal Cutting* **SAWS**

Better Machines-Better Blades

ARMSTRONG-BLUM MANUFACTURING CO.

5700 Bloomingdale Avenue *"The Hack Saw People"* **Chicago 39, U. S. A.**



A section of a DSC Annealing Department showing a battery of portable, gas-fired, radiant tube, convector furnaces. Another engineering advance pioneered by DSC for producing better Steel Strip.

What you get *besides* width in RELIANCE Steel Strip

UNIFORMITY

STEEL STRIP is cold rolled steel that is *rolled and processed* to strip standards—not merely slit or sheared to a strip width, whether in coils or cut lengths.

Strip manufacturing practices give steel strip certain mechanical and surface properties not commonly available even in kindred products. . . . Perhaps the chief advantage of steel strip is its *uniformity*—uniformity of dimension, workability and finish. You will find this so on one-time orders and also on "repeat" lots. You get *uniform* individual parts, *uniform* components, and *uniform* final assemblies. You benefit from more efficient, more economical fabrication and more acceptable end-products.

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Immediate delivery from warehouse stocks or shipped on short notice, in accordance with your own "prescription" direct from DSC Mills at Detroit or New Haven. For helpful action call our nearest plant or office.

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Slabs • Sheet Bars • Billets • Wire Rods
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COLD ROLLED STEEL STRIP and FLAT WIRE

Coils . . . Cut Lengths . . . All Tempers

SHEETS

COLD ROLLED . . . HOT ROLLED . . . H. R. PICKLED . . . LONG TERNE . . . GALVANIZED

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Lies About Business

At the 30th annual convention of the National Industrial Advertisers Association, which was well attended by representatives of the metalworking industries, Fairfax M. Cone, president of Foote, Cone & Belding, presented a strong argument for the use of advertising to combat the prevalent idea that success in business is dishonorable. He declared that the often made statement that material success has brought about moral failure "is a lie as big as any told by Hitler or the spokesmen for Stalin."

This lie, he said, "is based upon opposition to business as we know it and its premises are these: That competition is wasteful, that bigness is bad, and that business is a sharpie, wholly materialistic and predatory, and profoundly unscrupulous."

"The real fact," he continued, "is that none of these things is true. Success in business is not inherently immoral, it does not necessarily come out of someone else's hide, nor make of the successful business man a moral failure. Competition is not necessarily wasteful, unless you hold that the production of more and better things for more and more people is totally unworthwhile."

Mr. Cone's reference to these lies about business is timely. We are about to witness the conventions of our two major political parties. These conventions will be held against a background of 20 years of government administration by a party whose leaders seldom overlook an opportunity to discredit business. That so many people think that success means moral failure, that competition is wasteful, bigness is bad and business is unscrupulous is due largely to the demagoguery of these leaders.

This demagoguery would have been less damaging and certainly of shorter duration if the opposition party had been more aggressive and if more of the people entitled to vote had done so. That this demagoguery has gone almost unchallenged for so long is due largely to the apathy of too many people who resent it but do nothing to stop it.

The approaching conventions afford new opportunities for both parties to be more realistic in their attitudes toward business. An end to anti-business demagoguery is over due.

E. L. Shaner

EDITOR-IN-CHIEF

WHO OWNS THE STOCK? Executives of metalworking companies should be grateful to the New York Stock Exchange for its initiative in commissioning the Brookings Institution to conduct the nation's first census of stock ownership. Until the Brookings' report was issued Monday, everybody had to guess at the number of stockholders in the country. An-

tibusiness politicians seemed to think that the typical stockholder is a rich Wall Street financier. They also held to the view that stockholders are a minority group whose votes don't amount to much.

The Brookings' count explodes these fallacies. There are 6,500,000 persons who own shares of publicly-held stock and there are 3,020,000 who have shares in companies with less than 100 stockholders whose certificates are not traded on any exchange. One-third of all shareholders are housewives and 76 per cent of all shareholders have annual incomes of $10,000 or less, after taxes. The Brookings' findings provide excellent material for industrial public relations activities.

* * *

NEW INFLATION HEDGE: A unique method of industrial financing which provides investors with protection of purchasing power and avails employees of a low-risk investment to serve as a hedge against inflation is being initiated by the Christiansen Corp., Chicago. This company, producer of aluminum and magnesium alloy ingots, zinc-base die casting alloys and other products for foundries, is issuing for purchase by employees 4½ per cent, 20-year debentures maturing July 1, 1972, in multiples of $100 in an amount totaling $300,000.

The feature which distinguishes these debentures from those previously issued by industrial corporations is that their face value is adjusted semi-annually to reflect changes in the Consumers' Price Index for Moderate Income Families compiled by the Bureau of Labor Statistics. This escalator device provides for a maximum of 150 per cent and a minimum of 100 per cent in the face value of the debentures. Thus in a period of rising prices a $100 debenture can rise to a maximum value of $150 but in a period of falling prices it cannot drop below its original face value of $100.

This is an interesting departure from orthodox financing which undoubtedly will attract attention.

* * *

AID IN RENEGOTIATION: Companies having 1951 defense contracts subject to renegotiation have filed Forms RB 1 and RB 1 b unless they obtained extensions beyond the deadlines of May 1 and July 1, respectively. Now the regional and central offices of the Renegotiation Board are studying these reports. You probably will soon get the opportunity to have a face-to-face meeting with renegotiators as across-the-table bargaining begins.

That's the time for you to put your best foot forward and present your case effectively. Many companies confronted with renegotiation problems may find helpful suggestions in the article beginning on page 72.

* * *

HIGH TECHNICAL AIMS: Asked what the automobile industry regards as its principal technical problems, the experts of General Motors' New Technical Center reply as follows (p. 75):

1. For automotive applications, the primary problem is developing better corrosion resistance. 2. For defense applications, it is developing better high-temperature alloys for turbine buckets and possibly atomic-powered vehicle parts. 3. Generally, it is learning to make the best possible use of metals which are available in adequate amounts on the North American continent.

These objectives certainly rate high priority, not only in motordom but also in many other branches of the metalworking industry. They present a real challenge to those in research who may discover new materials and methods and to those in operating departments who may find ways to conserve, substitute and improvise.

* * *

FASTER THAN THE EYE: Eighty years ago Edward Muybridge sought to prove that at one stage of a horse's gallop, all four hoofs are off the ground. He arranged 24 still cameras at intervals along the track so that the galloping horse would trip strings attached to the shutters of the cameras. He obtained a series of pictures which proved his point.

Today a high-speed motion picture camera, capable of speeds up to 3500 frames per second, solves complex problems (p. 90) much more accurately than did Muybridge's crude device. With a roll of film traveling at the rate of 100 feet per second, the camera reveals the details of action in the combustion zone of a blast furnace, in the tapping streams of open hearths or in the piercing of seamless tubes that cannot be observed by any other means. High-speed photography is becoming a very effective tool in metallurgical research.

A Quick Picture of Steel Stocks

What about current Ryerson stocks?

When the steel strike was called early in June our over-all stocks, though still out of balance from a size standpoint, were better than they had been for some months. Naturally we have been losing inventory since then. But here is the picture as these lines are written—6/25/52.

Our stocks of both carbon and alloy steel bars are quite spotty with larger diameter bars in short supply, the smaller sizes somewhat better. In carbon steel, cold finished bar stocks are better than hot rolled stocks. In alloys, carburizing types are the most plentiful.

Our stocks of plates and shapes are low, as these products are among the most widely used for defense applications, but we can meet most any requirement for *welded tubing* and for *straight chrome stainless.* And *sheets* are in fair supply, especially cold rolled, heavier than 19 gauge. Other products in good supply at Ryerson: *drill rod, tool steel, hydraulic tubing, structural tubing, Inland 4-Way Safety Plate.*

How about Ryerson service?

Our staff of experienced steel specialists is always at your service to give counsel on any steel problem. You may be surprised at what can be accomplished with their help. For example, we can often suggest practical alternates for steel that's not on hand. And if you always tell us what length or width you are actually using, we may sometimes be able to fill your order from smaller pieces when we could not handle it otherwise. Then too, we are continually adding to our service facilities; so you can depend on quick delivery of available steel.

What about the future?

With reasonable restraint on the part of steel users and conformance to government regulations during the strike, we should be able to take care of most essential requirements for some time. Upon resumption of steel production, we will replenish our stocks as rapidly as possible. Meanwhile, you may be sure we'll do our best to help whenever you call.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished.

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot and cold rolled, many types and coatings

TUBING—Seamless and welded, mechanical and boiler tubes.

ALLOYS—Hot rolled, cold finished, heat treated. Also tool steel.

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

BABBITT—Five types, also Ryertex plastic bearings.

MACHINERY & TOOLS—For metal fabrication

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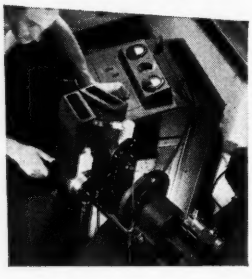
Our customers know that Inland

keeps steel quality consistently high.

These checks...made all through



production...demonstrate how.

INLAND STEEL COMPANY
38 South Dearborn Street, Chicago, 3, Illinois

STRIKE RECOVERY TIMETABLE

JULY	AUGUST	SEPTEMBER
It will take ten days after the strike ends before normal steel output resumes. Hardest hit: Civilian goods	Military priority projects will get much of this month's production	Military shipments begin to catch up; steel deliveries rise for civilian goods
OCTOBER	**NOVEMBER**	**DECEMBER**
Ore companies rush shipments to make up for strike-lost time before the season ends	Military deliveries back to a normal pace; civilian supplies: Steel tight	Yearend finds steel shortage still hurting, but the end is in sight

Steel Shortage: Worst To Come

Most of the troubles due to lack of steel will come after the steelworkers return to the job because it takes 10 to 14 days to get mills back to normal output

MORE SHUTDOWNS among steel consumers will occur after steelworkers go back to their jobs than before.

That paradox results because 10 to 14 days elapse before normal steel production can be resumed after a long shutdown. Steel stocks now among many metalworking plants are either practically depleted or badly unbalanced.

The Reason Why—So, steel users are beginning now to close down thick and fast, and still more will be forced to follow suit even as the steel mills reopen. Most consumers that are down when the strike ends figure that it will take an average of two weeks from that time before they can resume production. As of July 5, the nation had lost 10,933,000 tons of ingots because of strikes this year.

Starting operations in steel mills are highly variable. A big task is notifying crews to report. Coke ovens have been kept hot throughout the strike by supervisors or by regular workers through arrangements between the company and union and can be returned to full production quickly. Blast furnaces have been banked. If the banking has not been for too long, the first cast can be made 10 to 12 hours after the crew reports. Since this strike was so long, more time may be required. Once crews are assembled, it takes 5 to 7 days to get open hearths back to normal production. With luck, soaking pits and blooming mills can be operating within 48 hours after workers return. But cold pits may require new bottoms, causing an additional time loss. Finishing mills can usually be operating within a few hours after the crews get back.

Some Help—One fortunate thing about the effects of the steel strike: The worst of the pinch comes just at the time many companies plan holiday shutdowns anyway. The July 4 weekend signifies the beginning of the peak in the vacation season.

Many manufacturers of finished products of all types have enough steel for their own operations, but are closed down or soon will be because of imbalances or shortages in the stock of subcontractors and suppliers. That's the problem in production of military tanks, where a situation is similar to that in the output of most defense goods. Military tank plants have enough steel to continue production until late July or early August, says Brig. Gen. C. H. Deitrick, Ordnance Tank-Automotive Center, Detroit. He fears his production may be hardest hit for lack of steel among subcontractors weeks after the strike is settled.

Same Headache—Makers of appliances and other civilian products have the same worry. Controls on household gadgets, for example, are tight (see the story on p. 62) and curtailing output as much as any lack of steel in the producers' plants.

Cast steel turrets will be the bottleneck in tank production, especially this fall. At the start of the strike, cast steel turret production was just up to tank production. Most of the foundries producing the tank turret were affected by the walkout.

STEEL COMPANIES with ingot capacity totaling almost 6.5 million net tons of steel annually had signed up with United Steelworkers of America—CIO on terms close to WSB recommendations as of the middle of last week. They are:

COMPANY	LOCATION	ANNUAL CAPACITY (net tons)
Pittsburgh Steel Co.	Pittsburgh	1,072,000
Kaiser Steel Corp.	Fontana, Calif.	1,380,000
Detroit Steel Co.	Portsmouth, O.	650,000
Universal-Cyclops Steel Co.	Bridgeville, Pa.	70,160
Copperweld Steel Co.	Warren, O.	618,380
Barium Steel Corp.	New York	886,000
Northwestern Steel & Wire Co.	Sterling, Ill.	321,000
Pacific States Steel Corp.	Niles, Calif.	232,000
Firth Sterling Inc.	McKeesport, Pa.	20,040
McLouth Steel Co.	Trenton, Mich.	581,100
Heppenstall Co.	Pittsburgh	55,550
Judson Steel Corp.	Emeryville, Calif.	76,500
Jessop Steel Co.	Washington, Pa.	33,490
Rotary Electric Steel Co.	Detroit	425,000
TOTAL		6,421,820

Copper Strike Possible

Companies facing an easing demand will fight hefty wage hikes even harder than last year

ANOTHER nation-wide copper strike—nearly as bad as the one last summer that tied up some 60,000 workers in mines, smelters and fabricating plants—is in the making.

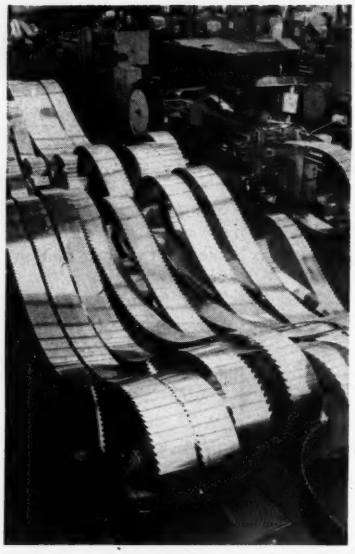
Most union contracts expired on June 30 or will on July 31. Some only have certain clauses up for negotiation. This year United Mine, Mill & Smelter Workers are demanding up to 25 cents an hour plus fringes—and they got a hefty boost just last August. Mining companies involved include American Smelting & Refining Co., Anaconda Copper Co., Kennecott Copper Corp., Phelps-Dodge Copper Corp. and others. The Garfield, Utah, plant organized by the CIO steelworkers has already signed up.

Fight—In the wage talks this year, the companies are fighting harder than before. They are facing an easing market and increased competition from abroad. A strike is unlikely so long as negotiations continue. Last year copper workers stayed on the job without a contract for over a month during negotiations. Another factor is the steel strike.

Copper workers are watching the steel developments closely, and will expect similar treatment.

Worry — The strike threat is bothering Washington too. Last week's temporary dropping of inventory restrictions on copper—and aluminum—was an incentive to fabricators to build up stocks in case of trouble this month or next. The government is even considering paying a flat price for copper accumulated in Chile. This tonnage would be added to the national stockpile, for release to industry if the domestic strike were prolonged. It would also keep foreign suppliers from applying the price squeeze when copper is needed the most.

Hardest hit by a big wage increase would be the marginal outfits—the high cost mines. If they couldn't get the price ceiling raised, they'd have to seek further subsidies or go out of business.



Teeth of Steel

These 50-foot endless band-saw blades, made by the Simonds Saw & Steel Co., Fitchburg, Mass., are joined together with General Electric atomic-hydrogen welding equipment. In use, they will travel at express-train speed. Simonds engineers say the atomic-hydrogen welding method is the best they have found for joining the bands so they won't part when in operation

Strike Hits Appliance Makers

CIO strike at Robertshaw-Fulton Co.'s thermostat plant at Youngwood, Pa. is worrying some appliance makers more than the steel strike.

The walkout—now entering its thirteenth week—has halted the plant's large output of controls for gas stoves, water heaters and space heaters. And some of Robertshaw-Fulton's customers are finding it difficult to get these controls from the strike-bound company's competitors.

The workers at the Youngwood plant are organized by the CIO steelworkers union, which is making the same demands upon the company as it's making upon the steel industry.

Weirton Seeks $5.50-ton Hike

An increase of $5.50 a ton on its resumed production is being sought from the government by Weirton Steel Co. The 25-cent-an-hour package increase Weirton negotiated with an independent union will hike costs $10 a ton, but the company will absorb the remainder.

Price Controls Chief Ellis Arnall said Weirton would not get approval for any amount larger than OPS pricing standards—$3 a ton.

Emphasis on Prices

Amendments to the hastily extended defense act change controls mostly in that area

PRINCIPAL effect of the new Defense Production Act Amendments on metalworking will be on prices.

Priority powers and defense production loans as provided in the old law get extended until next June 30. Consumer credit control authority is gone, but that had already been relaxed. The power to control credit on new homes is extended until June 30, with same relaxation. International Materials Conference allocation of scarce materials will be continued. Wage controls, weakened slightly, will be kept until next Apr. 30. WSB's powers are clipped.

Until Next Spring—Price controls also are extended until that date. A significant change in price curbs will be the move to force OPS to make the Herlong amendment applicable to price regulations promulgated before Aug. 1, 1951. The Herlong amendment was tacked on to the defense act last year. It stipulated that wholesalers and retailers would be entitled "hereafter" to the markups they enjoyed in the immediate pre-Korea period; the revised Herlong amendment makes that provision retroactive.

So, many original regulations will have to be rewritten to allow higher ceiling prices for distributors. Whether there will be demands for higher markups from distributors whose regulations were written subsequently remains to be seen.

Few Complaints — OPS spokesmen say there has been very little criticism of any of the price orders issued after July 31, 1951. They don't expect much trouble. If there are complaints, the emergency court of appeals has been given more power to remedy them.

Otherwise, the main effects of the new price amendments are to free many foods from controls.

Fasteners Outlook: Shortages Ahead

Fastener makers were faced with spotty shortages in heavy bolt sizes the first half of this year. Now the steel strike portends a long shortage in all sizes

SCREW AND BOLT makers who struggled the first half of this year to pick up their spotty inventories will see them dumped again by the steel strike.

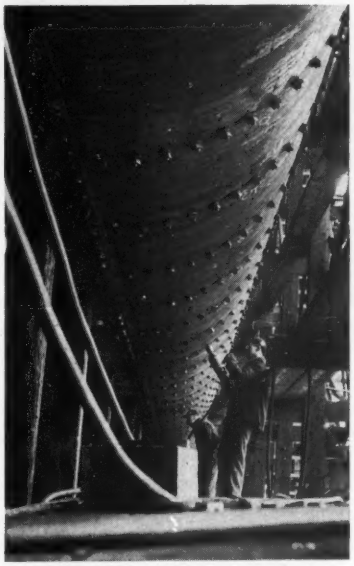
Most fastener makers are exhausting their 45-day supplies of material. Those closing for vacations doubt if they'll reopen until they get more steel. When they do open, officials figure it will take about six weeks for every week the steel mills are shut to catch up with demand again because the capacity of the industry isn't flexible enough to absorb a hurry-up load. That puts them 30 weeks behind right now.

Loose and Tight — Although fastener makers bolted to a record year in 1951, they threaded their way carefully in surplus-and-shortage-plagued 1952. Sales overall dropped only 6 per cent from the record high of last year, still 26 per cent above 1950. But order backlogs, dropping on some items, were rising on others almost impossible to obtain.

Particularly short are the larger bolt sizes—⅝ inch diameter and larger. Mills overproduced on back orders of material for the smaller bolt and screw sizes, but even with NPA sympathy the screw makers couldn't get stock for the heavier sizes.

Not Defense—That's what created the surplus-shortage picture in the various sizes, not defense orders as many people thought. Estimates vary from 4 to 35 per cent as to the percentage of the total output going for defense. One cue to the amount is the fact that the proportion of alloys to carbon steel consumed is 3½ times the peacetime rate. But most fastener makers agree defense hasn't disturbed their civilian customers' supplies much.

With a period of shortage ahead, they may. Aircraft, tank and ship needs could bulk very large in a struggling output. Then, too, the military may take even greater bites for aircraft if it makes up its mind what it wants, say the fastener makers.



PATTERN OF SHIP FASTENERS
. . . empty holes coming soon?

Stripping—In any event, screws and bolts are going to be short. Firms making them report orders are starting to come in again at a faster rate as users try to guess how their output is going to look for the rest of the year and order accordingly. They don't want to be faced with piles of parts and no means of fastening them together.

If history repeats, even when the situation gets better there will be spot shortages of some sizes; but as of now the scramble for nuts and bolts of all sorts is on.

Freight Car Restrictions Ease

Restrictions on builders of railroad cars are easing up to accelerate the construction of vitally needed railroad equipment. Two significant steps in this direction are the announcements by National Production Authority that unit controls over the production of railroad contract cars will be eliminated and that quota restrictions on construction of freight cars and tank cars will be suspended Jan. 1, 1953. However, builders will still be subject to materials allocations and inventory restrictions.

Removal of the unit controls will become effective with the allocation of materials in the fourth quarter of 1952 for first quarter 1953 production. Contract car builders were given no assurance that they would get more materials. They reported that their inventories are low and unbalanced.

The Railroad Contract Car Builders Industry Advisory Committee asked NPA for a formal "defense" classification so that it will be placed in a more favorable position to compete for steel when the mills begin rolling again.

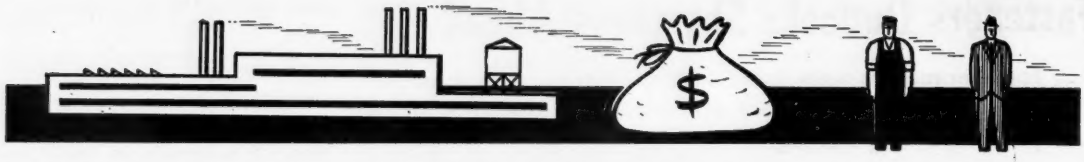
Meanwhile, makers of railroad freight car components told NPA that their industry will run into trouble unless steel production is resumed soon. Materials shortages caused considerable cancellation and deferment of orders before the strike, the committee said. And now they have only enough materials for production through July and part of August, with time out for vacation close-downs.

Both the contract car makers and component makers recommended that NPA issue CMP allotment tickets for fourth quarter as if no steel strike were in progress and without regard to carry-over tickets or probable mill production schedules.

Atomic Power Plant Feasible

Plutonium and electric power can be produced economically by nuclear fission, reports a research team organized by Monsanto Chemical Co. and Union Electric Co. of Missouri. After a year of study on the subject, the team recommended that the Atomic Energy Commission set up a pilot plant to include a modified nuclear reactor of the type built at Hanford, Wash. They think such a reactor will do the job.

Both companies have expressed a willingness to invest their own time and money in the project. Edwin J. Putzell Jr., secretary of Monsanto, said that when the legal question of ownership of reactors can be adjusted, private industry will be more willing to invest in such work on a full-time scale.



Worth of 100 Largest Manufacturing Corporations

AS REPORTED AT END OF 1951 (IN MILLIONS)

Stand. Oil Co. (N. J.)	$4,707	Inland Steel Co.	$381	Monsanto Chemical Co.	$262
Gen. Motors Corp.	3,672	Union Oil Co. of Calif.	381	Caterpillar Tractor Co.	254
U. S. Steel Corp.	3,141	Pittsgh. Plate Glass Co.	380	Skelly Oil Co.	234
Stand. Oil Co. (Ind.)	1,801	Sun Oil Co.	379	United Aircraft Corp.	231
Socony-Vacuum Oil Co.	1,792	Amer. Cyanamid Co.	374	Natl. Lead Co.	230
E. I. du Pont de N. & Co.	1,599	Radio Corp. of Amer.	370	Borg-Warner Corp.	229
Texas Company	1,549	Amer. Smelt & Ref. Co.	363	Coca-Cola Co.	221
Bethlehem Steel Corp.	1,542	Singer Mfg. Co.	355	Amer. Radiator & S. S.	216
Gulf Oil Corp.	1,512	Phelps Dodge Corp.	337	Wheeling Steel Corp.	215
Gen. Electric Co.	1,460	Celanese Corp. of Amer.	335	Bendix Aviation Corp.	210
Stand. Oil Co. of Calif.	1,366	Pure Oil Co.	332	Pullman, Inc.	208
Westinghouse Elec. Co.	1,004	Tide Water Assoc. Oil Co.	328	Owens-Illinois Glass Co.	206
Union Carbide & Car. Co.	978	Reynolds Metals Co.	319	St. Regis Paper Co.	205
Cities Service Co.	973	Allis-Chalmers Mfg. Co.	316	Richfield Oil Corp.	202
Inter. Harvester Co.	909	Continental Oil Co.	312	Crown Zellerbach Corp.	200
Sinclair Oil Corp.	880	Amer. Viscose Corp.	300	U. S. Gypsum Co.	198
Shell Oil Co.	792	Weyerhaeuser Timb. Co.	300	Gen. Amer. Trans. Corp.	195
Phillips Petroleum Co.	780	Continental Can Co.	299	Kaiser Steel Corp.	190
Chrysler Corp.	758	Gen. Foods Corp.	292	Nash-Kelvinator Corp.	190
Western Electric Co.	748	Borden Co.	283	Walker-Gooder. & Worts	190
Amer. Tobacco Co.	734	Stand. Oil Co. of Ohio	278	Natl. Biscuit Co.	188
Anaconda Cop. Min. Co.	732	Burlington Mills Corp.	276	Johns-Manville Corp.	177
Republic Steel Corp.	692	Philip Morris & Co.	265	Olin Industries, Inc.	176
Kennecott Copper Corp.	687	Ohio Oil Co.	265	Wilson & Co.	176
Goodyear Tire & Rub. Co.	659	J. P. Stevens & Co.	265	Crane Co.	172
Aluminum Co. of Amer.	640				
Jones & Laughlin Stl. Corp.	592				
R. J. Reynolds Tob. Co.	578				
Armour & Co.	503				
Atlantic Refining Co.	482				
Liggett & Myers Tob. Co.	480				
Swift & Co.	480				
U. S. Rubber Co.	463				
Eastman Kodak Co.	461				
Firestone Tire & Rub. Co.	459				
Natl. Steel Corp.	453				
Inter. Paper Co.	448				
Distillers Cp.-Seagrams	447				
Youngstown Sh. & Tube Co.	439				
Schenley Industries, Inc.	438				
Allied Chem. & Dye Corp.	436				
Dow Chemical Co.	427				
Armco Steel Corp.	416				
B. F. Goodrich Co.	416				
Procter & Gamble Co.	397				
Inter Bus. Mach. Corp.	394				
Amer. Can Co.	393				
Natl. Distillers Prod.	388				
Natl. Dairy Prod. Corp.	387				
Deere & Co.	384				

Total assets are shown after deducting reserves for depreciation. Table does not include *Ford Motor Company*, with total assets of $1,469 million on Dec. 31, 1950, and United Fruit Company, with total assets of $365 million on Dec. 31, 1951, which companies do not publish detailed income accounts.

U.S. Manufacturers with Over 50,000 Shareholders

CORPORATIONS	Number of Shareholders	Number of Employees
General Motors Corp.	478,924	469,197
United States Steel Corp.	268,226	301,328
Standard Oil Co. (New Jersey)	254,000	120,000
General Electric Co.	252,993	210,200
Cities Service Co.	203,402	21,802
Radio Corporation of America	186,592	57,657
Socony-Vacuum Oil Co.	158,000	64,000
E. I. duPont de Nemours & Co.	138,168	86,874
Anaconda Copper Mining Co.	118,616	39,672
Standard Oil Co. (Indiana)	116,800	49,740
Texas Company	113,642	39,747
Standard Oil Company of California	104,857	32,339
Westinghouse Electric Corp.	102,912	108,654
Union Carbide & Carbon Corp.	102,460	65,000
Sinclair Oil Corp.	100,687	22,112
Bethlehem Steel Corp.	98,207	152,578
Chrysler Corporation	92,200	114,850
Kennecott Copper Corp.	87,657	26,594
American Tobacco Co.	57,017	19,000
R. J. Reynolds Tobacco Co.	71,734	11,469
International Harvester Co.	71,000	93,46[illegible]
Phillips Petroleum Co.	70,233	20,618
Eastman Kodak Co.	69,510	69,100
American Radiator & Std. San. Corp.	67,004	22,581
National Biscuit Co.	66,682	29,480
General Foods Corp.	66,375	17,825
Republic Steel Corp.	65,229	69,545
Swift & Company	64,440	76,000
National Dairy Products Corp.	63,797	43,399
Armco Steel Corp.	53,713	28,032
Borden Company	51,479	32,475

Materials Handling: On the Upswing

Calling the turn: Material Handling Institute, Industrial Truck Association, Conveyor Manufacturers Association and Caster and Floor Truck Manufacturers Association

THERE WILL be an upturn in materials handling equipment sales in the second half of this year. That was the opinion of most of the members of the Materials Handling Institute, the Industrial Truck Association, the Conveyor Manufacturers Association and Floor Truck Manufacturers Association meeting at Mackinac Island June 30-July 1.

First effects of the upturn will be felt after the July plant vacation shutdowns are out of the way, thinks L. West Shea, of the Union Metal Mfg. Co., Kent, O., and president of the MHI (whose membership is made up of manufacturers of all types of material handling equipment).

Bright Horizon—There will be three influences: 1. Management will have a better conception of its profit picture for 1952 in second half. 2. There will be further pressure to offset rising manufacturing costs through materials handling methods. 3. Government appropriations not yet spent will be reflected in new business later this year. In fact, government buying is expected to be good all through 1953.

While new business for the entire industry is off lately from a year ago, shipments are up 17 per cent and total for the year at $1,250 million will be about equal to the 1951 volume.

Speaking for the industrial truck industry, Walter E. Schirmer, vice president of the Clark Equipment Co., Buchanan, Mich., and president of the Industrial Truck Association, says business for his group totaled about $70 million for first half and is expected to reach $80 million in second half. Truck sales last year were $193 million.

Standard Bearers—The entire industry is hard at work on improving equipment and is establishing standards for the benefit of the user. All of the improvements will be on display at the industry's fifth national exposition in Philadelphia Convention Hall May 18-22, 1953. Already 95 per cent of the available space has been sold.

The industrial truck industry has agreed on standards for fork mountings so that such attachments may be used on various makes of trucks. Other standards under consideration include stability of fork trucks and braking of motorized hand trucks.

New U.S. Steel Plant Plans Lag

Construction of U. S. Steel Corp.'s new plant at Morrisville, Pa., is now four to five months behind schedule. Blast furnaces will not start until this fall and full production of tin plate, sheets, pipe and bars will not be reached until next summer.

When the plant was started, it was hoped some flat-rolled production might be started by the third quarter, but engineering changes, material shortages and bad weather scotched the plans.

Firm Makes Aluminum Billets

Aluminum Billets Inc., Youngstown, has opened a new furnace plant to produce billets for the aluminum industry growing up in the Youngstown area. The plant, which cost approximately $100,000, includes about 4000 square feet of floor space and a new furnace designed and built by Superior Industries Inc., a sister company. The firm will cast billets of regular commercial sizes.

Cryolite Output Subsidized

Amount of cryolite available to the aluminum industry in the next 12 months will be more than doubled under terms of a contract negotiated by Defense Materials Procurement Agency with Pennsylvania Salt Mfg. Co., Philadelphia.

Pennsylvania Salt is one American producer of this chemical which is used as a flux in reducing alumina to the solid metal.

SUPER ALUMINUM INGOTS
. . . Kaiser-developed for A'r Force

Giant Aluminum Ingot Developed

Kaiser Aluminum & Chemical Corp. says it has successfully developed a new giant-size aluminum ingot for heavy press forgings.

The new casting process—developed at the company's metallurgical research division in Spokane—provides high-strength, alloy-75S ingots for mass-production of large aircraft parts in the Air Force's $389 million heavy press program.

The new method allows production of usable ingots approximately three times as large as any present-day forging and extrusion iluminum ingots, says the company. The 75S ingots will attain 32 inches in diameter, 85 inches in length and will weigh up to 7000 pounds.

Early development, which began at the end of World War II, revealed that ingots cast to such specifications tended to split and crack during the casting operation. Kaiser Aluminum undertook development of large high-strength ingots about a year ago.

Earlier this year the company contracted with the Air Force to operate four $50 million mammoth presses, two at Newark, O., and two at Halethorpe, Md.

The two Newark forging presses will turn out 3 million pounds of forgings per month, and the Halethorpe extrusion presses will make 3 million pounds in aircraft parts.

PATTON 48's ROLL FROM CHRYSLER DELAWARE PLANT
. . . ordnance has high hopes for its innovational foundry masterpiece

New Medium Tank, Long-Sought by Ordnance, Unveiled

THE NEWEST addition to the ground forces weapons was put on display last Tuesday at two widely separate spots when Chrysler Corp. at Newark, Del., and Ford Motor Co. at Livonia, Mich., unveiled the T-48 medium tank. The third member of the automotive big three, General Motors, through its Fisher Body Division at Grand Blanc, Mich., also produces it.

The new medium (in the 45-50-ton class) is to be the successor to the M-47, only recently accepted by the ground forces. That was an interim design incorporating several of the innovations to be found on the T-48. The new tank differs significantly from any other tank in the field. Two immediately noticeable parts give it its distinctive appearance, the one-piece cast hull and the one-piece cast turret; both of which employ sloping and elliptical sides so that a flat surface is not presented as a target.

Long Sought — The one-piece cast armor steel hull appears to be a masterpiece of foundry workmanship and has been a much-sought-after development from Ordnance's standpoint. It is understood, however, that because of the still-limited capacity for castings of this size as greater production of this tank is achieved some hulls will be made in five sections and joined by rolled armor plate. The small steel castings required for this tank are said to no longer be a critically short item since railroad requirements of steel castings have decreased.

The tank is powered by an 810-horsepower Ordnance-Continental air-cooled engine, operated through the Allison cross-drive transmission. Its crew of four is one less than man the M-47.

Unusual Rate—Chrysler has been making deliveries of this tank since April 11, minus gun and mount. Fisher Body's first complete unit was delivered April 28 and Ford's came through a little later. Chrysler Corp. has had an usual role in this triumvirate. The tank was conceived and preliminary drawings were made by engineers at the Detroit Arsenal, but engineering it for production was Chrysler's duty.

Following the unveiling of the new tank at Newark, Chrysler and Army officials signed the formal contract turning over to Chrysler the Detroit Arsenal. Chrysler takes full responsibility for the plant's operation July 10, the facility becoming known as the Chrysler Detroit Tank Plant. Highly likely: The arsenal and American Locomotive Co., the two M-47 producers, will turn to T-48s (but Ordnance people just say "something else" will be produced).

Tool and Die Backlogs Rise

Order backlogs of contract tool and die shops are rising for tools, dies, jigs, fixtures, molds, gages and special machines, says National Tool & Die Manufacturers Association. This resumes the upward trend in backlogs begun in 1950, which was interrupted by increased concellations in the first quarter, 1952.

Lapointe: Revamping Pays

Production nine times the pre-Korean rate by year-end will mark the 50th anniversary of Lapointe Machine Tool Co., Hudson, Mass. The manufacturer of broaches and broaching machines to make jet engines and ordnance equipment is working around the clock, seven days a week, and still has a one year backlog of orders.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $250,000

PRODUCT	CONTRACTOR
Milling Machines	Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.
	Kearney & Trecker Corp., Milwaukee
Lathes, Tool Room	R. K. LeBlond Machine Tool Co., Cincinnati
Grinders	Cincinnati Milling Machine Co., Cincinnati
Trucks, Fork-Lift, Gasoline	Hyster Co., Portland, Oreg.
Trucks, Fork-Lift, Electric	Yale & Towne Mfg. Co., New York
Trailers, Warehouse	Fan-Weld Corp., Philadelphia
Trailers, 7½ Ton (2 Contracts)	Steel Products Co., Savannah, Ga.
Automotive Tools	McKay Co., Pittsburgh
Shells, 105 mm	Malleable Iron Range Co., Beaver Dam, Wis.
Fuzes	Casco Products Corp., Bridgeport, Conn.
	Frank J. Curran Co., Downers Grove, Ill.
Cartridge Cases	Revere Copper & Brass Inc., New York
Periscopes	Minneapolis-Honeywell Regulator Co., Minneapolis
	Eastman Kodak Co., Rochester, N. Y.
Range Finders	Eastman Kodak Co., Rochester, N. Y.
Cartridges, Tracer	Remington Arms Co., Bridgeport, Conn.
Cartridge Balls, cal. .30	Winchester Repeating Arms Co. Div., Olin Industries Inc., New Haven, Conn.
Machine Gun Parts, cal. .50	Colt's Mfg. Co., Hartford, Conn.
Barrel Assemblies	Flannery Bolt Co., Bridgeville, Pa.
Radio Transmitters	Western Electric Co., New York
Receiver-Transmitters	Allen B. Du Mont Laboratories Inc., E. Patterson, N. J.
Headsets, Microphone	Lionel Corp., New York
Teletypewriter Sets	Teletype Corp., Chicago
Electron Tubes	General Electric Co., Schenectady, N. Y.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

ZINC—Revocation of NPA Order M-9 on June 27, 1952, removes all inventory controls from zinc. Allocation controls were removed from zinc on May 15.

CANS—Direction 4 to NPA Order M-25 permits packers to use tin plate bearing any weight of tin coating for perishable foods without regard to Schedule 1 of M-25, and directs can manufacturers to give preference to orders for packing perishable foods. Direction 4 was issued June 30 and made effective on that date to cushion the impact of the steel strike on the preservation of 1952 food crops.

AUTO WRECKERS—NPA Order M-92 requiring auto wrecking yards to wreck out old cars for scrap was revoked July 2, 1952.

Controlled Materials Plan

MRO—Amendment of June 25, 1952, of CMP Regulation 5 alters restrictions on procurement of maintenance, repair and operating items. Aim of the change is to eliminate some of the hardships which have resulted from the $1000 limitation on individual installation projects, and a reduction in the paper work required of industry. The $1000 limitation on the cost or quantity of materials used for a single installation project is removed. The amendment was effective June 25.

CASTINGS—Direction 14 to CMP Regulation 1 grants to manufacturers of Class B products additional advance allotments for seven calendar quarters to cover their requirements and those of their secondary consumers for carbon steel (including low alloy) castings weighing 10,000 pounds or more. The direction is designed to encourage placement of authorized controlled materials orders for such castings in sufficient time prior to requested delivery dates that order boards can be kept full. Such castings are in short supply and efforts are being made to assure full production. Direction 14 was issued June 30 and made effective on that date.

COPPER, ALUMINUM—Direction 1 to CMP Regulation 2 suspends inventory limitations on copper and aluminum. This temporary measure permits consumers to take in copper and aluminum they have ordered but which they may not be able to use because of a shortage of steel resulting from the steelworkers' strike. Direction 1 was issued June 30 and made effective on that date.

"B" PRODUCTS—Amendment 1 of Direction 1 to CMP Regulation 1 stipulates that a maker of Class B products must obtain all his controlled materials either by self-authorization under that direction or by filing a form CMP-4B. The amendment was issued June 30, 1952, and made effective on that date.

M. B. McCAFFERTY
Director, NPA Iron & Steel Division

NPA Regulation

SLAB ZINC—Amendment 2 of NPA Regulation 1 deletes slab zinc from the list of materials under inventory limitations. The amendment was issued June 30, 1952, and made effective on that date.

Price Regulations

MACHINERY RESELLERS—Supplementary Regulation 2 to Ceiling Price Regulation 67 authorizes resellers of machinery and related manufactured goods to use manufacturers' published price lists which have been approved by the OPS, even though discounts or margins established by these price lists are not identical to those in effect on June 24, 1950. The amendment was effective June 25, 1952.

Amendment 33 of CPR 30 permits manufacturers of machinery and related manufactured goods to apply to OPS for approval of published list prices where the manufacturer was in the process of revising his list prices before June 24, 1950, and actually put such revised list prices and discounts into effect before Jan. 25, 1951. The amendment was effective June 25, 1952.

Amendment 8 of CPR 67 permits resellers to use manufacturers' published list prices approved by OPS under Amendment 30 of CPR 30. Amendment 8 was effective June 25, 1952.

IMPORTED COPPER—Amendment 21 of General Overriding Regulation 9 exempts from price control all sales of foreign primary copper and copper refined from imported ores, concentrates and imported raw materials including scrap. The amendment was effective June 25, 1952, and results from the rise in prices on copper from Chile.

LAWN MOWERS—Amendment 11 of Supplementary Regulation 12 to Ceiling Price Regulation 22 removes power and hand lawn mowers from the list of commodities included in SR 12. Lawn mowers had been included in the list so that record-keeping could be reduced pending study of the need for a tailored price regulation for the industry. A tailored regulation will not be issued. The lawn mower producers will be under CPR 22. Amendment 11 is effective July 31, 1952.

USED MACHINERY — Revision 1 of Ceiling Price Regulation 105 permits inclusion in the base prices of used industrial and construction machinery, from which the ceiling price is computed, the freight charges from the factory where the machine was originally manufactured to its location at the time of sale. Special provision is included for factory rebuilt and guaranteed machinery so that under specified circumstances prices higher than those for reconditioned and guaranteed machines may be established. The revision also covers the sale of unused machinery that has been purchased for use but not actually used. Each sale to a steel mill, foundry or other consumer must be supported by a statement given by the purchaser to the seller that the machine is being bought for use and not for reduction to scrap metal. Revision 1 was issued June 30 and made effective on that date.

ALUMINUM FLUORIDE — Amendment 7 of Supplementary Regulation 7 to Ceiling Price Regulation 22 sets dollars-and-cents ceiling prices for sales in the United States by manufacturers of aluminum fluoride and fluxing grades of synthetic cryolite. The amendment was issued June 30 and made retroactively effective on June 1, 1952.

BRASS MILL PRODUCTS — Amendment 1 of Ceiling Price Regulation 68 authorizes producers of brass mill products to increase their ceiling prices to reflect increases in the cost of imported copper. The increases generally amount to 3.84 cents a pound of copper content. The amendment was effective July 1, 1952.

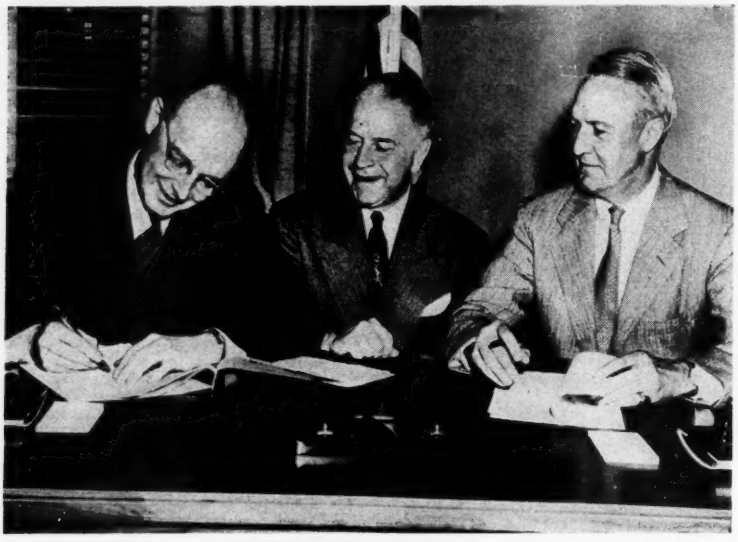
COPPER WIRE MILLS—Amendment 1 of Ceiling Price Regulation 110 authorizes manufacturers of copper wire mill products to adjust their ceiling prices July 1, 1952, to reflect increases in the cost of imported copper.

STEEL WAREHOUSES — Amendment 3 to Ceiling Price Regulation 98 provides steel warehouses with a method for recalculation of their ceiling prices to immediately reflect increases in producers' ceilings. Up to now, no provision was made to reflect changes immediately in a warehouse's cost and it has had to wait until the 16th of the following month before putting new ceilings into effect. In some cases this would result in a lag of as much as 45 days. Amendment 3 was effective June 30, 1952.

SMALL WAREHOUSES—Amendment 2 of Ceiling Price Regulation 98 authorizes certain steel warehouses grossing $100,000 or less a year to establish ceiling prices under the General Ceiling Price Regulation rather than under CPR 98. The change is designed to stop "daisy chain" sales, where markup is pyramided on markup. The amendment was issued June 30, 1952, and made effective on that date.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*



Seaway Project Gets Helping Hand

In a step designed to open the way for New York state participation in construction of the St. Lawrence Seaway, U. S. and Canada requested the International Joint Commission to approve the power project near Massena, N. Y. Canadian Ambassador H. H. Wrong, left, Canadian Minister of Transport Lionel Chevrier, center, and Acting Secretary of State David K. Bruce exchange notes. The action does not bar Congress from approving future U. S. government participation

Guaranteed currency convertibility and protection from losses due to expropriation are now offered in ten free nations. Capital investment abroad should pick up

EXPROPRIATION and currency inconvertibility will no longer plague companies establishing branches in ten free nations abroad. Agreements necessary to the issuance of guaranties against investment loss were concluded with Austria, Denmark, Greece, France, Italy, Norway, Belgium, China (Formosa), Federal Republic of Germany and the Philippines.

Three other countries have signed currency convertibility agreements and negotiations now are under way to expand these agreements to guarantee against expropriation also. These are Turkey, the Netherlands and the United Kingdom. Negotiations are under way to extend this guaranty arrangement to all the free nations in the military assistance and Point Four programs. When the program is completed, an American manufacturer may invest money in a branch plant anywhere in the free world without danger of having his assets confiscated or having an embargo placed on conversion of his foreign currency.

Score:39—So far 39 American companies have received guarantees of currency convertibility and two of them, Firestone Tire & Rubber Co. and Otis Elevator Co., also have guaranties against expropriation. Among others who have convertibility guaranties are: Minneapolis-Honeywell Regulator Co.; Dow Corning Corp.; Ford Motor Co.; Yoder Co.; Standard Oil Co. of New Jersey and Westinghouse Air Brake Co.

Action on additional applications is in process and the Mutual Security Agency feels private capital can soon assume the role of helping our allies increase their productive power with a proportionate cut in appropriations for foreign assistance spending. The two major roadblocks to the goal, expropriation and inconvertibility, will be assumed by government.

Important Point—An important requirement of the guaranty program is that the government concerned and the director for Mutual Security must approve the prospective investment for which a guaranty is sought as a contribution to the Point Four or Mutual Defense programs in the country.

The investment guaranty program is described in a leaflet, "Protection for American Investments Abroad". For the booklet or further information, write the Industrial Guaranties Branch, Mutual Security Agency, Washington 25.

FCC Shelves Heating Specs . . .

Industrial heating equipment with radio frequency output manufactured prior to July 1, 1947, may be operated through June 30, 1953, without certification under Sections 18.21 or 18.22 of the FCC Rules and Regulations. Reason for the further postponement by FCC is that huge numbers of old heating units are in use and it would take an undesirable quantity of strategic materials to replace them with units of modern design. Too, there is a shortage of measuring instruments needed to certify.

In the meantime, however, users of any kind of industrial heating equipment operated on radio-frequency energy must conform to the rule that emissions on frequencies outside the allocated bands (13,553.22 to 13,566, 26,960.00 to 27,280.00 and 40,660.00 to 40,700.00 kilocycles) must not exceed a field intensity of 10 microvolts per meter at a distance of one mile from the heating equipment.

With a view to early action in spelling out a rule with respect to radio-frequency-stabilized electric arc-welding equipment, the commission is studying comments received from members of the industry. Under this proposed rule, arc-welding equipment manufactured after a date to be decided on will have to conform to the same requirement—namely, that emissions must not exceed a field intensity of 10 microvolts per meter at a distance of one mile from the installation.

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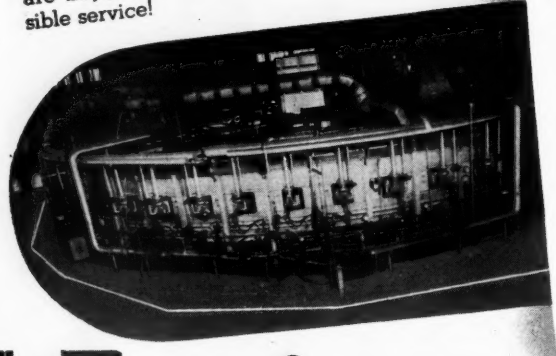

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April 10, 1952

Levinson Steel Co.
So. 20th at Wharton St.
Pittsburgh 3, Pa.

Gentlemen:

We have just received your shipping schedules on the five rotary furnace shells we have on order with you and wish to advise they meet our requirements. Incidentally, we know from experience dating back many years that you will get the fabricated steel shells out as promised.

You may not realize it, but we credit the ready acceptance by Industry of Hagan Rotary Furnaces not only on our proven design and reliability, but on your accurate fabrication and scheduled shipments.

Your company has supplied 90% of our rotary furnace fabrications, each made according to our specifications, and always shipped on time! Naturally, it is results like this that make dealing with you a pleasure.

Cordially,

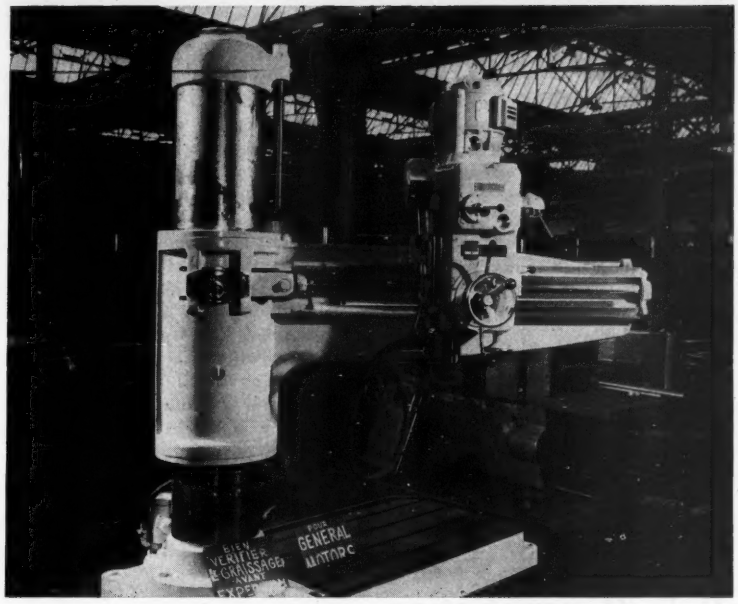
GEORGE J. HAGAN COMPANY

A. D. Dauch
Vice President

ADD:ACJ

The Levinson STEEL COMPANY
20TH & WHARTON STS., PITTSBURGH 3, PA.

25 *Fabricators of Steel for Industry*



FRENCH MACHINE TOOL GOES TO CHEVROLET
. . . million dollar order helps fill dollar gap

Get Down to Work, U. S. Told

Amazing recoveries being made by European technology, German chemical processing and equipment for one, portend stiff competition ahead for world markets

THE UNITED STATES, winner by default in many lines of world industrial activity since World War II, will have to take off its coat and get down to work if it wants to stay in front of foreign competition.

Rapid Bounce Back—That's the view of at least one American industrialist who has returned from abroad. E. W. Forker, head of Blaw-Knox Co.'s Chemical Plants Division, after a month's inspection tour in Europe said: "The recovery of German industry has been spectacular . . . European technology, particularly that of the Germans, once again is in position to make itself strongly felt, especially in chemical processing and equipment.

"One of the firms associated with Chemical Plants Division, the Linde Eismaschinen firm of Munich, developed a low temperature process for producing both tonnage and high purity oxygen and for separating all types of industrial gases. U. S. firms have recently placed three contracts for the construction of oxygen plants embodying the modern German Linde processes. . . It should alert us to the need for aggressive leadership in engineering."

Growing Up—In the last twenty-five years American chemical manufacturing has been expanding at an average rate of 10 per cent a year, compared with an average annual growth of 3 per cent for all industry.

Exports of chemicals and allied products reached an all-time high in 1951 of $1.6 billion, reports L. N. Markwood of the Commerce Department. But, he says, "Evidence seems to indicate that 1951 highs will not easily be exceeded. The trend toward self-sufficiency is continuing abroad, and has been encouraged by governments (ours and theirs) as well as by industry itself."

Up to now equipment for plants of foreign chemical producers has been largely supplied from this country, too. What will happen when foreign competitors bid against U. S. manufacturers for that original construction as well as for supplies of chemicals presents a challenge.

U.K. Hitches Hopes to Comet

Indications are that airplanes may become a major export for Great Britain in the future. Exports of aircraft and parts (mostly military currently) have been rising since 1945 and were valued at £42 million in 1951.

Up to now Britain has been hampered by a lack of suitable types of heavy aircraft for civilian world airlines. Advent of the British "Comet" changed all that. Four overseas airlines have already placed orders for the Comet and progress is being made in the export of smaller planes and helicopters.

French Tools: No Direct Aid

None of the three plants of French firm G. S. P. (Guillemin, Sergot and Pegard), which sold Chevrolet a million dollars worth of machine tools, has received direct Marshall plan or Mutual Security Program funds. G. S. P. benefited only indirectly through the recovery of other French industrial plants which were aided by such funds.

It is noteworthy, too, that the French manufacturers will be allowed to spend only 3 per cent of the dollars earned on the deal for whatever they wish in the dollar market. Eighty-five per cent of the dollars go directly to the French government's banking system (the seller is paid the equivalent money in francs), and 12 per cent may be spent outside France for government-approved items only.

Italian Tools: Pulse Stronger

Italy's machine tool industry grows steadily stronger. Italian imports of machine tools dropped from about $25 million in 1950 to about $20 million in 1951. Exports rose from about $15 million to nearly $20 million in the same period.

Leading targets for Italian machine tool exports in 1951 were the United Kingdom, taking $3.5 million worth, and the U. S., taking about $2.5 million worth.

Renegotiation: Facts you Should Present

1. Prove efficiency by giving the quantity of production and expansion of facilities. Show how you used available facilities to the limit, maintained standards of quality. Give your rejection record, your decrease in unit costs. Outline mechanical difficulties you overcame and problems with labor.
2. Prove reasonableness of costs and profits by comparing them with previous years, other contractors' profits and costs. Compare renegotiable and non-renegotiable costs; show effect of volume on costs and profits.
3. Show the importance of capital employed by outlining the net worth and source of capital at the start of the year. Show changes during the year.
4. Prove the extent of risk assumed by showing the possible increase in costs of labor and materials, delays from inability to get materials, cutbacks in quantities, refunds made before renegotiation because of price redetermination.
5. Show your contribution to defense by describing the experimental and development work you did for defense, technical assistance to competitors.
6. Describe the character of your business by showing the nature of your product and the degree of skill and precision required.
7. If you received no financial or material assistance from the government emphasize the fact.
8. If renegotiable business requires comparatively more of your total assets, bring that out.
9. If your renegotiable business forces you to abandon some of your normal civilian markets, emphasize that fact. If your production that's renegotiable is in such volume that you will saturate future markets, bring that out.
10. Document facts wherever possible. In nebulous matters, such as assistance to competitors or speed in delivery, commendatory letters are effective.

You Can Help Yourself in Renegotiation

When bargaining starts soon on 1951 defense work, aid your cause by selecting a good man to represent you and knowing the kind of facts effective with renegotiators

RENEGOTIATION: Called by some business men the tax on patriotism or the tax that taxes patriotism.

Whatever you call it, you have to live with it because renegotiation of defense contracts will be with us as long as we live in this defense economy. If you haven't done so already, now is the time to start figuring how you can best get along with renegotiation. The across-the-table dickering on 1951 contracts begins soon.

It Pays Off—It will be worth your while to be well prepared for your negotiations. Renegotiators in World War II went over about $190 billion in contracts. They recovered more than $10 billion, taking back profits if, generally, they ran more than 10 or 11 per cent before income taxes. Thus, about 5.3 per cent of the money spent on government contracts during World War II eventually went back into the federal coffers. Accountants agree that countless dollars were recovered by the government, not because of gouging by renegotiators, but because of ignorance and indifference by business men who thought the profit inroads were only temporary.

But renegotiation today appears to be practically permanent. If World War II trends continue, renegotiators will reclaim from American business $1.6 billion on the $30.3 billion paid out for 1951 defense contracts.

Theory—The theory of renegotiation is praiseworthy. Congress passed the current law on Mar. 23, 1951, as an attempt to prevent anyone from making an undue profit out of war. It probably succeeds in that, but it also succeeds in exasperating business men to such an extent that at least one manufacturer sold out and retired because "I can't put up with another round of renegotiations."

The proceedings are not quite complex enough to drive everyone to retirement. Much of the paperwork on 1951 business is already behind you. Form RB (Renegotiation Board) No. 1 had to be filed May 1. It listed your renegotiable business. RB 1b had to be in by July 1 unless you won an extension. That form analyzed and allocated your costs.

Screened—The big Renegotiation Board in Washington is now studying the estimated 12,000 RB 1b's submitted by you who did renegotiable defense business in excess of $250,000 in 1951 or in the first fiscal year ending after Dec. 30, 1950. Another 15,000 had submitted the RB 1, but had less than $250,000 in renegotiable business and so were exempt.

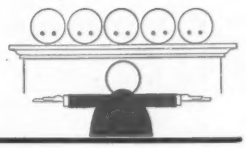
The filing of RB 1b does not constitute the commencement of renegotiation proceedings, points out Charles F. Lemons of Haskins & Sells, public accounting firm. Those proceedings are started by the mailing of a notice to that effect by registered mail to you. The registered letters will be coming along any time now. From the time you file RB 1b, the government has one year to send you notice and two years from the date of the notice to complete renegotiation.

Assignment—The big Renegotiation Board will designate the 12,000 cases as Class A or B. Class A generally are those reporting a profit of more than $400,000 from renegotiable business, and B cases are those reporting a profit of $400,000 or less. The big board has delegated authority to regional boards to make recommended determinations of excess profits to the big board in A cases and in Class B to make final determinations of excess profits. The regional board to which the case is assigned will notify you of the assignment and whether you are A or B.

Most cases will be assigned on a

Renegotiation: How To Deal with Renegotiators

1. Pick a skilled bargainer to handle your affairs.
2. Select a man who knows the financial facts of your company, and is familiar with the operational side, too.
3. Use a man who knows selling, to put your company and its arguments in the best light.
4. Give renegotiation the attention it deserves. If your case conforms to World War II patterns, you'll have to pay back 5.3 per cent of the total value of your defense business—$53,000 on $1 million in contracts.
5. Detailed facts to support your position will influence renegotiators. Avoid last-minute fact hunts.
6. Be honest with negotiators, but still put your best foot forward.
7. Don't try to overawe renegotiators by bringing along a battery of "experts" to handle your affairs.
8. If your case is complex, you may be wise to hire professional accounting or legal help, just as you may do in preparing your tax returns.
9. Make note of your mistakes in this year's proceedings—both in questionnaires (as revealed in across-the-table bargaining) and in the way your bargaining is performed. You can remedy some mistakes when proceedings for 1952 start with the filing of your next RB 1 on Apr. 1, 1953.
10. Seek a voluntary settlement. The carrying o' a disputed case to the Tax Court is expensive and time-consuming.



geographical basis. A few big or unusually complex ones will be handled by the big board. A few of the 12,000 may also be judged not subject to renegotiation. Of those that go to regional boards, about 22 per cent will be assigned to Chicago, 18 per cent to New York, 16 per cent to Detroit, 16 per cent to Los Angeles, 10 per cent to Boston and 18 per cent to Washington (the regional board, not the big one also there).

Procedure—If your case—A or B—goes to a regional board, it will be assigned to a board member if it is a big or different one, and also to an accountant, points out Edwin McElwain of Covington & Burling, a Washington law firm. If your case is not so big or not so difficult, it will be assigned to a staff renegotiator and an accountant. The board member, or the renegotiator, then goes through your Forms 1 and 1b with the accountant and decides whether and to what extent more information is required. The chances are that you will be called in for a conference at this stage to determine what information is available. This is an important meeting, for it's one where you make your first personal impression. For the meeting, it's wise to know the type of information that's effective with renegotiators. When all the information has been assembled, you will usually get the call for another meeting when you may discuss the data presented as well as any other matter you consider pertinent. Those two meetings are crucial. For tips on how to handle your presentation and what kind of information to give, see the accompanying lists.

After those meetings, the regional board will tell you of its decision on the amount of excess profits. If yours is a B case and you agree with the determination, that is that and your case is settled. If yours is an A case, the determination will be reviewed by the big board. If it concurs and you do, too, then you pay your money. If the big board doesn't approve the A case decision as recommended by the regional board, the central group may refer the case back to the regional or take it on itself. In either event, you're probably in for more meetings.

Protest—If yours is an A case and you don't agree with the regional's determination, your case will be reassigned to the big board for action. It probably will require more meetings with you, after which it will make its determination. If yours is a B case and you don't agree with the regional board's decision, ask the big board to review it within 90 days of receiving the regional's determination by registered mail. If within 90 days after you have received the regional decision and the big board has done nothing about your case either on its own or at your request, assume that the regional verdict is approved by the central board despite your objections.

Then your only recourse is to the Tax Court of the U. S., which will make a whole new case of your problem, not merely review the Renegotiation Board's determination. The Tax Court's judgment is final and no further relief is available in any other court or government department or agency.

In the Minority—When you object to a decision, but the big board makes or approves the determination anyway, that's "unilateral action." On the basis of history, such actions will be few. From 1942 through 1946, less than 2000 of about 188,000 renegotiation proceedings resulted in unilateral action.

The whole purpose of your presentation before the renegotiators is to avoid unilateral action. You want to work out a voluntary agreement because you will fare best that way.

Opportunity—All forms RB 1 and most RB 1b's have now been filed. The fat is in the fire on those, but your best chance to help yourself is still ahead—when you personally bargain with the renegotiators and gather additional information they may require. That first, personal impression is the most important of all. Our defense economy will probably last for years and renegotiation will be an adjunct of it. You set the pattern this year for your treatment the next, and the next and the next.

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Mirrors of Motordom

Largest furnace in the research metallurgy department at GM's Technical Center is this 1700-pound, three-phase, direct arc unit shown pouring an experimental heat. A special exhaust system removes all gases even when the furnace is being tipped for the pour

Corrosion resistance, better high-temperature alloys and making-do with metals found in abundance in North America are big problems tackled by automotive technologists

DETROIT

YOU have to credit the automotive industry with many of the important advances in metallurgy over the past 40 years. Either through its own developments or through pressure exerted by the industry on its suppliers have come more wear-resistant metals, standardization and classification of materials, closer tolerances, better heat-treating methods and scores of other improvements.

So dynamic is the industry's performance that once it recognizes its problems and starts out to solve them, you reasonably can expect early progress.

What does the auto industry today regard as its big technical problems? Here are the answers as offered by the men who are working on them at General Motors' new Technical Center:

1. For automotive applications, the No. 1 problem is developing better corrosion resistance.

2. For defense applications, it is developing better high-temperature alloys for turbine buckets and possibly atomic-powered vehicle parts.

3. Generally, it is learning to make the best possible use of metals which are available in adequate amounts on the North American continent. This involves conservation of available but scarce materials, substitutions for those which are not available and better combinations and use of all metals.

Coating the Assembly—One approach to the corrosion problem which is getting a workout at GM is the Aldip process by which steel and other ferrous metals are coated with aluminum to increase both heat and corrosion resistance. The process is particularly adaptable for coating automotive exhaust pipes, exhaust manifolds for diesel engines and heat exchangers for tank auxiliary motors.

The Aldip process coats the finished assembly. GM technical men claim this has two advantages over the use of aluminum-coated sheets: 1. The coating is applied after forming operations which might crack the brittle layer at the bond between aluminum and steel; and 2. all the assembly is coated, even the edges.

Not Bright Enough—While Aldip assemblies offer improved corrosion resistance in some applications, they are not now being considered for moving parts or for exterior trim. The satin finish provided is not bright enough to appeal to the wife of the automotive buyer. And hard-headed automakers realize you don't sell cars in the laboratory but only in the dealers' showrooms.

White Brass Again—Elsewhere in the auto industry, white brass continues to be a favorite in the search for an attractive and corrosion-resistant material for exterior trim. Most every major builder and many suppliers are conducting experiments on coating bumpers, grillwork and similar items with this material.

Rumors that one of the Big Three is set to go to white brass are heard frequently in luncheon talk but details are vague.

High-Temperature Alloys—What progress is being made at GM in the development of high-temperature alloys for defense applications necessarily is guarded for security reasons. The 55,000-square foot metallurgical laboratory is equipped for experimental melts of all common metals and is outfitted with up-to-date laboratory and testing equipment for metallurgical research as well as pilot plant areas for experimental production operations.

Shell Mold Castings—Substantial progress in development of shell mold casting methods is being made in the experimental foundry. GM men believe that most of the bugs have been worked out of the process during the past five years and that large savings in machining time and in materials handling are now possible. What is needed, they say, is a cheaper bonding material.

Most obvious advantages in shell mold castings is the saving in ma-

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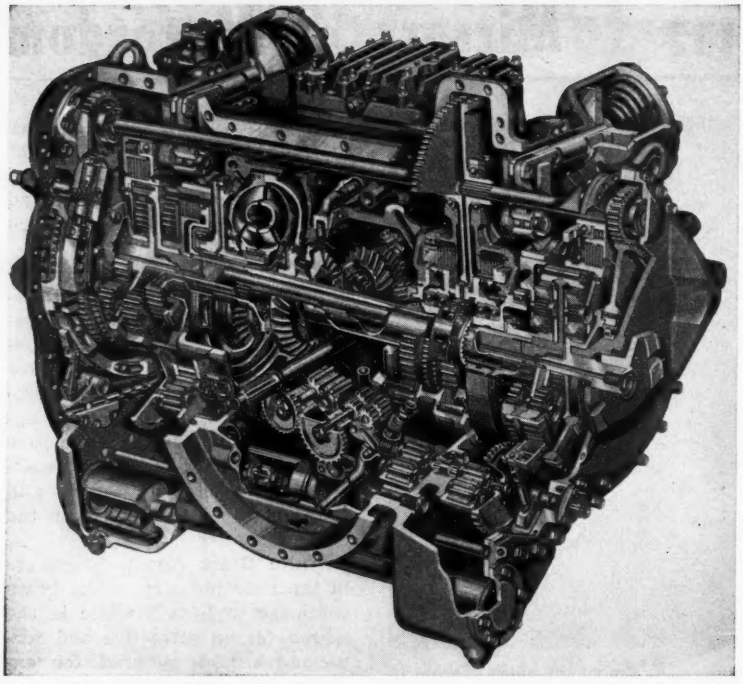

Some of the 4000 parts in the Allison CD-850 tank transmission are shown in this cross section. Despite its apparent complexity, the hydraulically controlled transmission, which combines braking and steering, simplifies operation of the General Patton M-46 and M-47 tanks and other vehicles in which it is used

chining time due to smoother surfaces and more accurate dimensions. How much machining can be saved depends on the part but it may run up to 50 per cent or even higher. In cast crankcases, for example, it is necessary to machine only the bearings.

A second advantage is a reduction in materials handled.

A third is the probability of making the mold on automatic machines and a reduction in the requirement for skilled labor.

Packaged Power

Down in Indianapolis, the Allison Division of General Motors is devoting a large share of its transmission capacity to building power transmissions for tanks and other military vehicles. A few days ago the 10,000th power transmission was delivered to Maj. Gen. E. L. Ford, chief of ordnance.

At the same time, Allison announced it is getting a $20 million contract for a new and larger cross-drive transmission. Army won't release any details on the size or type of vehicle on which the new transmission will be used.

Scuttlebutt around the plant suggests it may be used for a tank retriever. The new unit is larger than the CD-500 and CD-850 (numerals approximate horsepower) transmissions used on light and medium tanks. It may be as large as 1400 horsepower.

New Auto Transmission—Back in the shop some of the Allison boys are more interested in a small power transmission developed by Allison and now being kept under wraps. It may be Allison's post-defense surprise. Some of the new units reportedly have been produced in Canada and now are in operation on Canadian automobiles.

The story is that the new unit provides better performance than the Dynaflow or Powerglide and is cheaper to build. It also is claimed that the Allison job eliminates slippage.

Packaged Power — The heavy-duty Allison transmissions combine braking and steering with hydraulic shifting under full load. Is this the forerunner of one-package braking, steering and shifting for the post-defense car?

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,692	658,918
March	517,206	792,550
April	576,504	680,281
May	542,075	695,898
June	538,000*	653,682
July		522,858
August		571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161

Week Ended	1952	1951
May 31	104,892	121,476
June 7	128,807	152,656
June 14	130,544	157,026
June 21	129,574	158,909
June 28	125,365	156,105
July 5	88,000*	98,087

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Partsmakers Happy

Manufacturers of replacement parts for automobiles and trucks expect their 1952 business will exceed that of 1951 by 7 to 10 per cent. They expect last-half production will exceed first half.

The industry is optimistic over its ability to outlast the steel strike. Members say they will not feel any severe impact until after the first of August. Supplies of high-alloy parts, such as transmission and rear axle parts, may become tight before then.

Benefits Continue

Employees retiring under the Kaiser-Frazer retirement plan will continue to receive hospitalization, medical and surgical protection. Cost will be borne by the company-union social security fund.

Willys Makes First Delivery

Shipment of its first complete set of military aircraft landing gears was made recently by Willys-Overland Motors Inc., Toledo, with destination being Willow Run for installation in C-119 Packets made by Kaiser-Frazer.

The 400,000 square feet area of W-O's facility in which this work is concentrated has been converted and tooled-up in less than a year.

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For information on Titanium contact Mallory-Sharon Titanium Corp., Niles, Ohio

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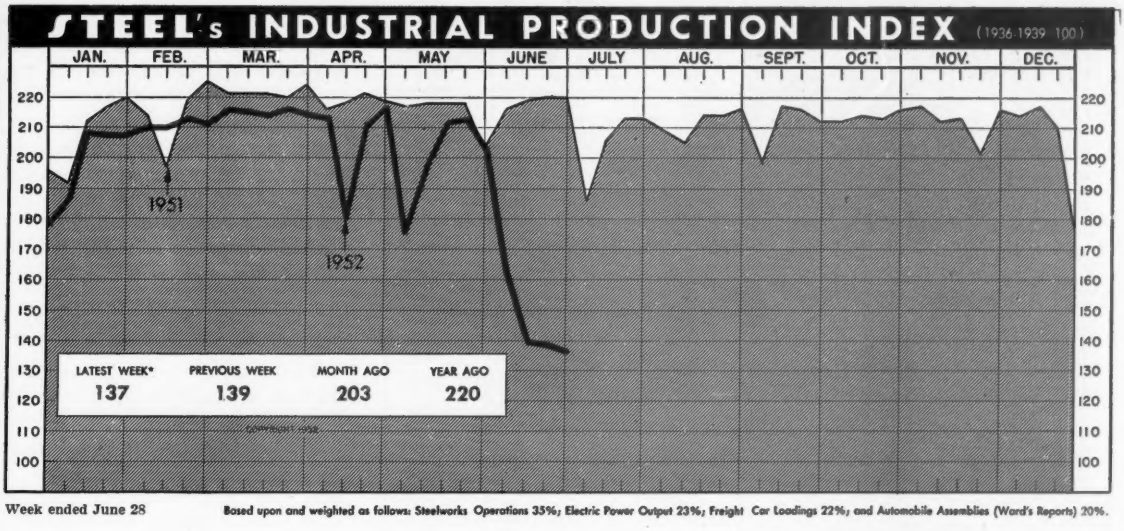


Week ended June 28

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Plant closedowns and reduced working schedules appear among metalworking companies as the steel supply worsens daily. Industrial activity index remains on its low plateau

IMPACT of the steel strike on the nation is becoming stronger daily, as the resulting steel shortage forces more companies to curtail operations.

Closedowns—Already some important steel users have braked assembly lines severely. General Motors Corp. laid off 12,000 workers, and Hotpoint Inc. and a number of other makers of heavy consumer durables are closing down civilian operations. Present number of closedowns is expected to multiply greatly in the early weeks in July, as metalworking companies use up the last of their steel supplies.

At present, there is little relief in sight from a nationwide spread of industrial layoffs and reduced working schedules. It takes the steel companies ten to 14 days to return to former operations, and by that time many steel users doing both civilian and defense work may have to bring operations to a complete halt.

Index—With steel production remaining a mere trickle (12 per cent of the pre-strike operating capacity) STEEL's industrial activity index edged downward two percentage points to 137 per cent of the 1936-1939 average in the week ended June 28. That's a decline of 76 points from the reading for May 24, the last full workweek before the strike, and 83 points under the same week, last year. Steel production dipped 0.5 of a percentage point in the week ended June 28, while production of passenger cars and trucks declined slightly. Freight car loadings mirrored the slowdown in industrial operations, declining to 630,000 cars, compared to 644,000 in the previous week and 761,000 in the week ended May 24, before the strike. Electric power generation remained at its high-for-the-season level in the week ended June 28.

Auto Output Drops . . .

The automotive industry is apparently headed for a blackout of civilian operations, as most companies near the bottom of the inventory barrel in steel supplies. Ironically, the forced curtailment of car output comes at a time when passenger cars are selling faster than they came off the lines during high-for-the-year production. At present, the U. S. passenger car industry is more than 1 million units behind the 1951 output. Predictions for third-quarter output can point only to a drastic widening of this gap.

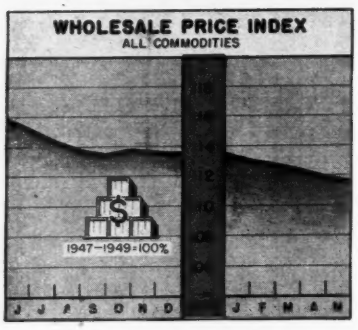
As the steel shortage cut production at some plants and a record heat wave sent workers home from others, U. S. and Canadian plants turned out 125,365 autos and trucks in the week ended June 28. That's a decline of 3952 units from the previous week and 31,740 under the same week in 1951, when combined U. S. and Canadian output reached 156,105 autos and trucks.

Business Conditions Worsen . . .

Business conditions continued to deteriorate in June, the National Association of Purchasing Agents reports in its monthly survey of member buyers.

Relaxation of credit controls didn't boost the declining production, while the steel strike also took its toll of production and jobs.

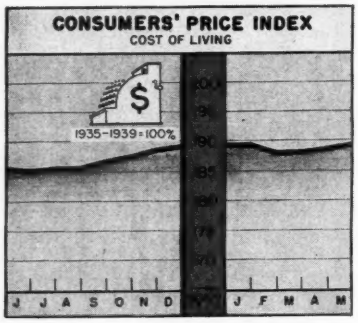
Prices of industrial materials continued to sag in June, though there was a slight tendency to level off. Many items sold below ceiling prices and competition was the keenest in many months. With many companies closing operations in July for vacations, further price



Wholesale Price Index
(1947-1949=100)

	1952	1951	1950
Jan.	113.0	115.0	97.7
Feb.	112.6	116.5	98.3
Mar.	112.3	116.5	98.5
Apr.	111.8	116.3	98.5
May	111.6	115.9	99.6
June	....	115.1	100.2
July	....	114.2	103.0
Aug.	....	113.7	105.2
Sept.	....	113.4	107.1
Oct.	....	113.7	107.7
Nov.	....	113.6	109.3
Dec.	....	113.5	112.1

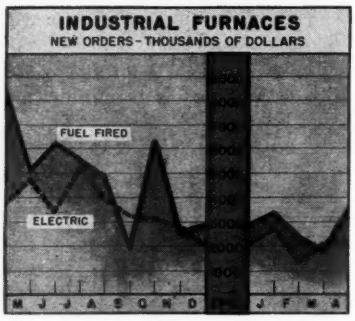
U. S. Bureau of Labor Statistics



Consumer Price Index
(1935-1939=100)

	1952	1951	1950
Jan.	189.1	181.5	168.2
Feb.	187.9	183.8	167.9
Mar.	188.0	184.5	168.4
Apr.	188.8	184.6	168.5
May	189.0	185.4	169.3
June	....	185.2	170.2
July	....	185.5	172.0
Aug.	....	185.5	173.4
Sept.	....	186.6	174.6
Oct.	....	187.4	175.6
Nov.	....	188.6	176.4
Dec.	....	189.1	178.8

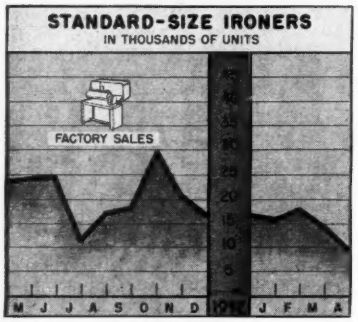
U. S. Bureau of Labor Statistics



Industrial Furnaces
New Orders—Tousands of Dollars

	Fuel Fired*		Electric	
	1952	1951	1952	1951
Jan.	3,379	4,033	2,856	2,764
Feb.	2,413	4,670	1,363	3,212
Mar.	1,813	7,019	2,100	4,846
Apr.	3,606	8,497	2,298	3,657
May	....	5,044	....	4,766
June	....	6,259	....	3,370
July	....	5,303	....	5,587
Aug.	....	4,850	....	3,891
Sept.	....	1,821	....	3,250
Oct.	....	6,374	....	3,172
Nov.	....	2,516	....	2,882
Dec.	....	2,875	....	2,100

* Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.



Standard-Size Ironers
Factory Sales—Units

	1952	1951	1950
Jan.	15,636	24,600	20,300
Feb.	17,630	32,400	27,600
Mar.	13,913	34,700	37,800
Apr.	8,938	23,700	31,600
May	.....	24,200	27,400
June	.....	24,500	27,100
July	.....	11,100	25,100
Aug.	.....	17,200	42,700
Sept.	.....	18,300	41,400
Oct.	.....	29,800	47,500
Nov.	.....	20,500	41,900
Dec.	.....	16,900	38,800
Total	.....	277,900	409,200

American Home Laundry Mfrs. Assn.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....June 9	Gray Iron Castings.June 2	Refrigerators ....June 16
Durable Goods ....June 23	Indus. Production ..May 26	Steel Castings ....June 2
Employ.,Metalwkg. June 23	Machine Tools ....June 2	Steel Forgings ....June 9
Employ., Steel ....Apr. 28	Malleable Castings.June 2	Steel Shipments ...June 23
Fab. Struc. Steel ..June 9	Pumps .....June 30	Wages Metalwkg. ..June 23
Freight Cars .....May 26	Radio, TV .....June 16	Vacuum Cleaners..June 30
Foundry Equip. ...June 9	Ranges, Elec. ....June 16	Washers .....June 30
Gear Sales .....May 26	Ranges, Gas .....June 16	Water Heaters ...June 30

reductions on plentiful materials are expected. Inventories shot downward in June, with the steel strike as the main cause of the reduction. With order books showing the heaviest decline since last August, prices falling, production schedules off, inventories are expected to drop even further in July, the association says.

Buying policy showed a trend to 30-60 day forward commitments in June. Only 3 per cent of the association's members reported a purchasing policy of more than 90 days in advance.

Workweek Down, Wages Up . . .

The average workweek of production workers dropped down to a pre-Korea level in May, reports the Labor Department. The factory workweek averaged 40 hours in May, compared with 40.7 hours in May, 1951. Longer workweeks in defense related industries were offset by reduced hours in consumer goods plants and by the effects of industrial strikes in the steel and petroleum industries. In the machinery and instrument groups, workweeks were cut down by about an hour over the year.

Weekly earnings averaged higher over the year despite the decline in man-hours. Earnings averaged $66.32 per week among workers in manufacturing companies, compared with $65.83 in May, 1951. Workers in the machinery group received $2.27 more pay weekly, electrical machinery workers received $2.12 more and fabricated metal products workers got $1.20 more in average weekly earnings. Due to the steel industry strike, primary metals industry workers received $4.73 less in May than in May, last year.

Washer Sales Lag . . .

Factory sales of household washers, following the downtrend in demand for heavy civilian durables, continued their decline in May. Unit sales declined 1.6 per cent to 213,688 units, reports the American Home Laundry Manufacturers' Association. The May total represents a drop of 15.9 per cent from May last year when 253,942 washers were sold.

Sales of automatic tumbler dry-

ers totaled 36,109 units in May, down 20.2 per cent from April and a loss of 10.8 per cent from dryer sales in the same month in 1951. Ironer sales totaled 12,652, up 41.6 per cent from the previous month and 47.7 per cent below the volume of ironers sold during May, 1951.

Radio, TV Output Halved . . .

Radio and television output plunged downward to nearly half the previous year's production in the year ended May 31, says Radio-Television Manufacturers Association. Factory sales totaled 12.5 million sets, compared with 23 million radio and TV sets sold in the year ended May 31, 1951. Factory inventories of these receivers dropped 31 per cent to 1.5 million units on June 1, compared with factory inventories of 2.3 million radios and TV sets in the same month last year.

Store Sales Jump . . .

Department store sales shot upward in May, recovering much of the ground lost in the earlier months of the year. May sales reached 6 per cent above last year to $13.5 billion, reports the Commerce Department. In the week ended June 28 total sales reached 6 per cent above the comparable week last year, and was the fourth consecutive week in which volume rose higher than the year-ago levels.

Low-Gear Sales . . .

Gear sales dropped to the lowest volume in May since July, 1950, says the American Gear Manufacturers Association. AGMA's gear sales index places May sales at 425.9 per cent of the 1935-1939 average, a drop of 52.8 percentage points from April and 241 percentage points under the reading for May, 1951.

Trends Fore and Aft . . .

The nation's gross national product in April and May edged up over the $328 billion annual rate reached in the first quarter . . . Contract awards for industrial building totaled $92.3 million in the week ended June 26. That's 60 per cent above the average week to date . . . Dun & Bradstreet's Commodity Price Index declined to the lowest level in 20 months in the week ended June 24 . . . Shipments of fabricated structural steel rose 5 per cent over the previous month in May . . . Loans to metalworking companies rose $50 million in the week ended June 18.

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	12.0	12.5	101.0
Electric Power Distributed (million kwhr)	7,200[1]	7,254	6,898
Bituminous Coal Output (daily av.—1000 tons)	1,308	1,212	1,817
Petroleum Production (daily av.—1000 bbl)	6,150[1]	6,148	6,180
Construction Volume (ENR—millions)	$365.1	$305.7	$316.7
Automobile, Truck Output (Ward's—units)	125,365	129,316	156,105
TRADE			
Freight Car Loadings (unit—1000 cars)	630	644	822
Business Failures (Dun & Bradstreet, number)	155[1]	151	188
Currency in Circulation (millions)[3]	$28,814	$28,787	$27,601
Dept. Store Sales (changes from year ago)[3]	+6%	+9%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,825	$16,610	$19,190
Federal Gross Debt (billions)	$258.5	$259.6	$254.4
Bond Volume, NYSE (millions)	$13.1	$12.4	$14.4
Stocks Sales, NYSE (thousands of shares)	6,025	5,672	8,724
Loans and Investments (billions)[4]	$75.0	$74.0	$70.4
United States Gov't. Obligations Held (billions)[4]	$32.4	$32.1	$31.2
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92	171.92	171.92
STEEL's Nonferrous Metal Price Index[6]	222.8	221.8	226.0
All Commodities[7]	110.7	111.2	115.0
All Commodities Other Than Farm and Foods[7]	112.3	112.5	116.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,635; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

you're *always* sure of getting the *right* cold rolled "strip" steel from Kenilworth

Your costs — and profits — may hinge largely on the cold rolled strip steel you use.

To make certain you get the *right kind*, every coil of cold rolled strip steel we sell is *now* identified by one of these tags.

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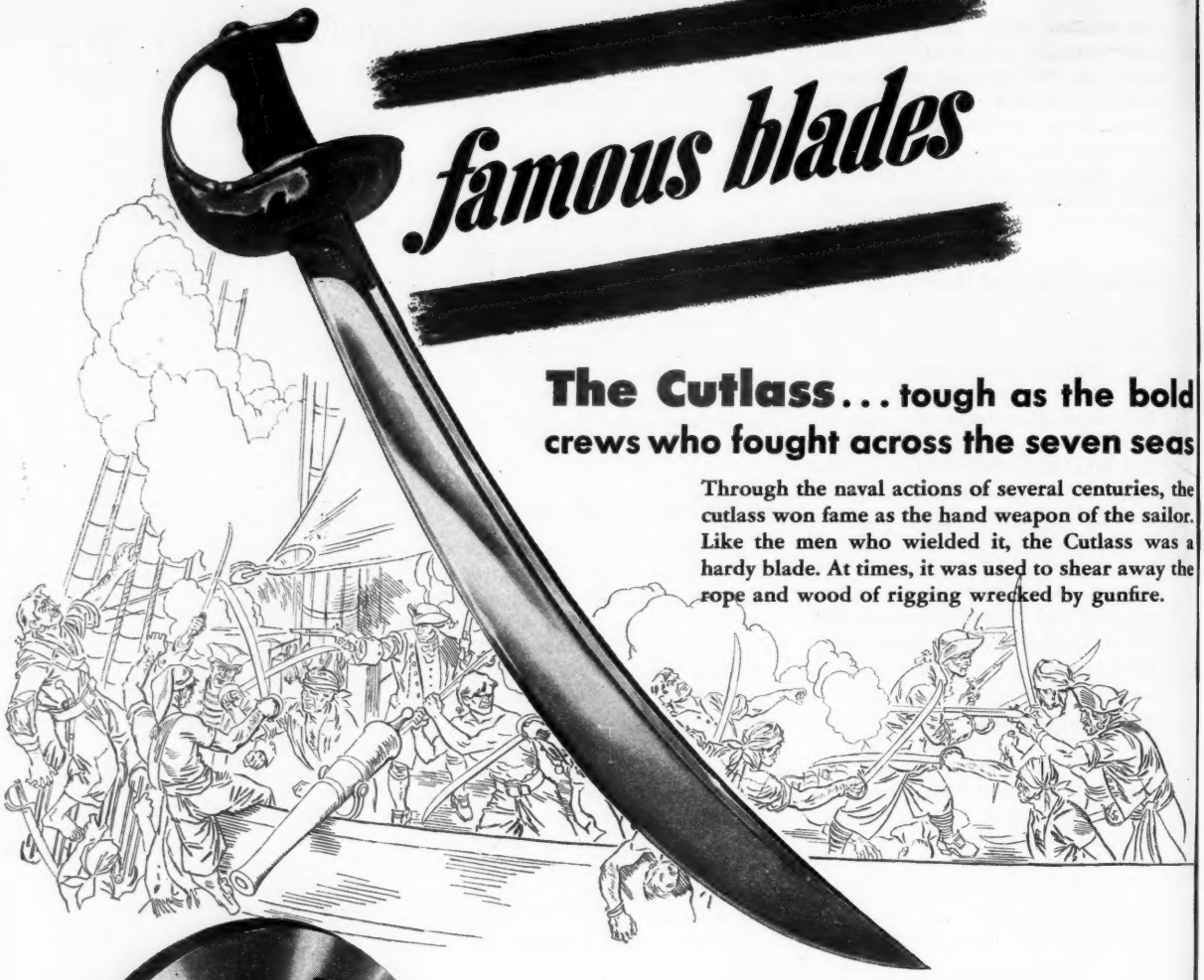
famous blades



The Cutlass... tough as the bold crews who fought across the seven seas

Through the naval actions of several centuries, the cutlass won fame as the hand weapon of the sailor. Like the men who wielded it, the Cutlass was a hardy blade. At times, it was used to shear away the rope and wood of rigging wrecked by gunfire.

Heppenstall **SHEAR KNIVES**... do industry's tough cutting jobs

Like the handy cutlass, modern shear knives made by Heppenstall are built to take it. Through technical development, they are continually improved to give better service and provide:

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- ★ MORE UNITS PER BLADE
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- ★ INCREASE IN PRODUCTION

To be certain of consistent high quality and productivity—always specify Heppenstall.

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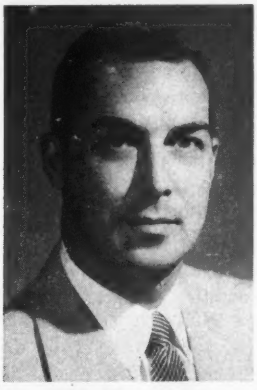
Men of Industry

S. W. FOUNTAIN
. . . Chicago Tramrail V. P.



FRANK E. RAY JR.
. . . Wico Electric purchasing agent

JAMES H. BINGER
. . . a V. P. of Minneapolis-Honeywell

S. W. Fountain was elected vice president and appointed to the board of directors, **Chicago Tramrail Corp.**, Chicago. Prior to joining Chicago Tramrail in 1951, he was with Westinghouse Electric Corp.

Robert E. Dwyer, executive vice president since 1940, was elected president of **Anaconda Copper Mining Co.**, New York, and its subsidiaries. He succeeds the late **William H. Hoover. Clyde E. Weed** becomes vice president in charge of operations, and **Edward S. McGlone,** vice president of the western operations of the company, was elected executive vice president.

Edgcomb Steel of New England Inc., Milford, Conn., elected **Joseph H. Roberts** chairman of the board. He is succeeded as president by **Joseph H. Roberts Jr.**, also treasurer of the company. Other elections include **Arthur W. Moody** as vice president in charge of sales, **Nils C. Erickson** as vice president, and **Edgar R. O'Brien** as secretary.

Martin George was appointed chief engineer, design and development division, **Columbian Vise & Mfg. Co.**, Cleveland.

Hooker Electrochemical Co. appointed **Charles A. Strack** to head up research and testing at its new Virgo Salt Laboratory at Niagara Falls, N. Y., recently completed, which will be used for research and development in various formulations for metal cleaning compounds.

Frank E. Ray Jr. was promoted to purchasing agent, **Wico Electric Co.**, Springfield, Mass. He has been assistant purchasing agent since 1951. **Eugene E. Durst** was appointed technical assistant to the manufacturing vice president, and is succeeded by **Vincent Bagnall** as manufacturing engineer.

Aluminum Industries Inc., Cincinnati, appointed **Eugene F. Eckerle,** vice president, as general manager. He has been a director since 1930 and was named vice president in 1941. **Richard G. Tessendorf,** sales manager, original equipment division, was promoted to assistant general manager in charge of manufacturing. **John H. Hater** succeeds Mr. Eckerle as secretary.

Keith P. Rindfleisch was appointed sales vice president, **United States Steel Supply Division,** Chicago, U. S. Steel Co., and is succeeded by **Hal P. Kibbey** as Chicago district manager.

Robert C. Carruthers was appointed assistant sales manager, welding products, **American Manganese Steel Division,** American Brake Shoe Co., at Chicago Hts., Ill.

A. B. Wells was appointed assistant manager, Atlanta sales branch, **Crucible Steel Co. of America.**

Frederick P. Salzman becomes works manager, original equipment division, **Cleveland Graphite Bronze Co.**, Cleveland. **William H. Havy** was named comptroller of the division.

James H. Binger was elected vice president, **Minneapolis - Honeywell Regulator Co.**, Minneapolis. He has been vice president in charge of the Belfield Valve Division in Philadelphia. His new headquarters will be Minneapolis.

Reed Rolled Thread Die Co., Holden, Mass., appointed **Joseph S. Seville,** formerly chief engineer, as superintendent and **George W. Lyman,** formerly superintendent, as chief engineer. **M. Lawrence Price,** professor of machine design at Worcester Polytechnic Institute, was granted a leave of absence to devote full time to research for Reed Rolled Thread Die Co. His activities will cover problems involved in formation of screw threads and special forms by cold rolling.

L. G. Porter and **Ray P. Johnson** were elected vice presidents of **Borg-Warner International,** export division of Borg-Warner Corp., Chicago. **R. A. Brown** was elected treasurer. Mr. Porter is also treasurer of Borg-Warner Corp. and Mr. Johnson is administrative assistant to the president.

S. G. Taylor Chain Co., Hammond, Ind., appointed **E. W. Taylor,** sales engineer, as its West Coast representative, with offices in the Los Angeles area.

Supreme Products Inc., Chicago, appointed **Tom Carney Sr.** to represent the firm in the sale of Supreme brand chucks. Mr. Carney

heads the T. C. Carney Co., Los Angeles.

Charles J. Nocar was appointed to

CHARLES J. NOCAR
. . . asst. to president of Hauserman

the newly created position of assistant to the president, **E. F. Hauserman Co.**, Cleveland. Since 1945 he has been director of research and development.

Phillip H. McManus, formerly general sales manager, was elected vice president in charge of sales, **Templeton, Kenly & Co.**, Chicago. In addition to directing sales, he will travel in the far western territory. **William H. Zepp** will assist Mr. McManus in Illinois, Indiana, Iowa, Kansas, Michigan, Missouri and Wisconsin. **N. L. Montgomery** was appointed manager of mining sales in southern Indiana, southern Ohio, Kentucky, Pennsylvania, West Virginia and Virginia, and will be assisted by **Richard S. Bowers. William D. Boldt** was assigned the Atlanta territory, and **Arthur C. Templeton** the Dallas territory.

Paul L. Wright was appointed manager of the Buffalo plant of **Joseph T. Ryerson & Son Inc.** He succeeds **Clarence S. Gedney**, retired.

Lucien A. Hennequin was appointed representative in the Philadelphia district for **Torrington Mfg. Co.**

J. P. Moore was appointed district manager of the Cleveland sales office, **Electric Controller & Mfg. Co.**, Cleveland.

W. B. McLaren becomes vice president in charge of industrial relations, **Kaiser-Frazer Corp.**, Willow Run, Mich., to succeed **W. W. Monahan**, transferred to a new position as manager of industrial relations for Kaiser Engineers Division, Henry J. Kaiser Co., Oakland, Calif.

Paul L. Funk was named Indiana district representative for **Fullerton Steel & Wire Co.**, Chicago.

E. L. Mitchell was named southwestern district manager for **Davey Compressor Co.**, Kent, O.

Robert A. Olen was elected president, **Four Wheel Drive Auto Co.**, Clintonville, Wis., to succeed his father, **Walter A. Olen**, now chairman of the board. They assume their new titles July 10.

Gordon B. Russell was named comptroller and **Willard R. Kimsey**

GORDON B. RUSSELL
. . . Kennecott Copper comptroller

assistant comptroller of **Kennecott Copper Corp.**, New York. Since January, 1950, **E. S. Hann**, treasurer, has performed the functions of comptroller in addition to his other duties.

Herman G. Eberling returned from Army duties to be assistant manager, Plains sales division, **Caterpillar Tractor Co.**, Peoria, Ill. **Gordon Fowler**, present assistant manager, Plains division, leaves Caterpillar to join Burford-Toothaker Tractor Co., Caterpillar dealer at Montgomery, Ala.

N. R. Aldrich, formerly sales manager, Continental Mfg. Co. Inc., becomes sales representative for **Fageol Heat Machine Co.**, with headquarters in Sheridan, Mo.

Oren H. Persons Jr., recently released from military service, rejoined **Edgcomb Steel Co.**, Philadelphia. He was appointed manager of specialty steels.

Francis J. Kinsella, sales manager in the Detroit territory for **Standard Pressed Steel Co.**, assumes the newly created post of midwest regional sales manager. He continues headquarters in Detroit. Mr. Kinsella is succeeded by **Daniel F. Hulgrave Jr.**

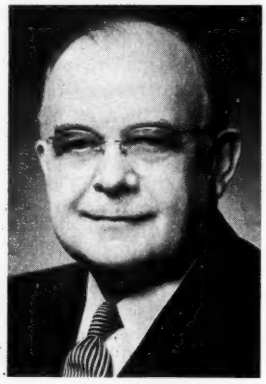
Walter A. St. Clair was named to head the newly created national accounts office in Chicago of **Hyster Co.**

Robert W. White was elected a director, **American Locomotive Co.**, New York. Formerly a vice president and treasurer of Union Carbide & Carbon Corp., he now is a member of Robert White Associates, business consultants.

Chemical Plants Division, **Blaw-Knox Co.**, Pittsburgh, announces that **Carl A. Benz** joined its research staff as senior physicist. He will assist in developing peacetime commercial uses of atomic energy.

Worthington Corp. appointed **Paul J. Foley** manager of its Kansas City office and **William M. Fine** manager of its Milwaukee office. Mr. Foley succeeds **W. R. Kennedy**, who was named a consultant to his successor.

C. B. Thomas was elected a vice president of **Chrysler Corp.**, Detroit. He is president of the com-



C. B. THOMAS
. . . a V. P. of Chrysler

pany's export division and continues in that capacity.

Robert L. Brehm was advanced to

"John, this building of mine holds a cost-cutting *Tip-Off* from ONE BUSINESSMAN TO ANOTHER"

"What is it?" asked John, a prominent appliance manufacturer.

The contractor answered, *"Simply this: don't take your fasteners for granted!*

"An RB&W man showed me how a switch in fasteners could help me make field connections much more economically.

"He suggested switching from rivets to high strength bolts. They cost more than rivets initially, but the assembled cost is much lower. My men work faster than with rivets. The building goes up faster."

You, too, can find a cost-cutting lesson from this story, whether you're in construction* or any other industry.

MORAL: Look to your fasteners for an often overlooked opportunity to reduce costs, and strengthen your competitive position. New inventions, like RB&W's SPIN-LOCK Screw, may prove more efficient than the fasteners you're now using. Or you may save by the stepped-up production you get from using the finest fasteners . . . RB&W bolts, screws, nuts and rivets of uniform accuracy, dependability and physical properties.

Let RB&W help you make the most efficient use of fasteners on your assembly line. Address RB&W at Port Chester.

RB&W—The Complete Quality line. Plants: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices: Philadelphia, Pittsburgh, Detroit, Chicago, Dallas, Oakland. Sales agents: Portland, Seattle. Distributors from coast to coast.

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RB&W 107 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

ROBERT JOHNSON
. . . product engineer, Nat'l Electric

ALEXANDER R. LINDSAY
. . . elected a V. P., Budd Co.

C. H. KUTHE
. . . heads tech. unit at Wolverine Tube

assistant chief engineer, **Snyder Tool & Engineering Co.**, Detroit. and subsidiary, Arthur Colton Co.

National Electric Products Corp., Pittsburgh, appointed **Robert Johnson** product engineer in charge of engineering development of underfloor raceway, surfaced raceway, and plug-in strip and mechanical connectors. For the last five years he has been a member of the general factory engineering staff at the Ambridge, Pa., plant.

Thomas L. Howard was named purchasing agent, **R. D. Werner Co.**, Greenville, Pa. He succeeds **Robert Stevens**, who is now a buyer with Kaiser Aluminum & Chemical Corp., Newark, O. Mr. Howard formerly was purchasing director for Patterson Foundry & Machine Co.

George M. Morrison was appointed controller, **IBM Trade Corp.**, New York.

Alexander R. Lindsay, chief engineer, automotive division, **Budd Co.**, Philadelphia, was named to succeed **Maj. Gen. G. M. Barnes**, U.S.A. (ret.), who is retiring as vice president in charge of research and engineering. **George E. Lallou**, assistant treasurer, becomes treasurer to succeed **Paul Zens**, retiring vice president-treasurer. **J. G. Richard Heckscher**, assistant secretary, was named secretary.

Heli-Coil Corp., Danbury, Conn., appointed **Edward H. Rice Jr.** manager of customer relations. He was sales engineer for Vermont Tap & Die Corp.

James S. Frey was promoted from general manager of **General American Transportation Corp.'s** Sharon, Pa., plants to general manager of manufacturing. He is replaced at the Sharon Works by **Harry B. Hunt Sr.** Mr. Frey will have headquarters in Chicago.

A technical sales unit, designed to render technical service on problems particularly related to heat transfer and product fabrication, was established by **Wolverine Tube Division**, Calumet & Hecla Consolidated Copper Co., with headquarters in Detroit. **C. H. Kuthe** will head the new unit, assisted by Messrs. **L. J. Bonacor, R. B. Davis** and **H. C. Flesch.** Mr. Kuthe formerly was manager of Wolverine's product development department.

James G. Rebeta was named manager of advertising and sales promotion at the St. Louis office of **General Electric Co.** He replaces **James M. McGarry**, appointed manager of the company's News Bureau at Schenectady, N. Y.

Louis J. Prior, traffic manager at the Toledo, O., plant, **National Supply Co.**, Pittsburgh, becomes assistant general traffic manager for the company.

OBITUARIES...

Ralph H. Sweetser, 81, consulting engineer in blast furnace practice since 1930 and prominent in that field for many years, died June 29 at his home in Rye, N. H. From 1920 to 1930 he was assistant to first vice president of American Rolling Mill Co., now known as **Armco Steel Corp.**, at its former plant in Columbus, O.

W. L. Lewis, 68, president, **Chicago Pneumatic Tool Co.**, New York, died June 28.

William S. McCormick, 59, chief, Used and Available Tools Section, Metalworking Equipment Division, **National Production Authority**, died in Washington June 21.

Melvin E. Haas, 45, Chicago district sales manager, **G. F. Wright Steel & Wire Co.**, Worcester, Mass., died June 13.

Elmer F. Sacrey, former president, **Unit Electric Tool Co.**, Syracuse, N. Y., died June 25.

John S. Raymond, 58, Chicago district sales manager, **National Tube Division**, U. S. Steel Co., died June 25.

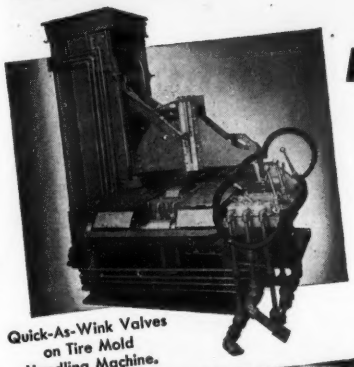
Fred A. Pritzlaff, 66, associated with **Falk Corp.**, Milwaukee, for 49 years, died June 21. He was superintendent of the Falk foundry for 30 years and the pattern shop for two years. After his retirement in January, 1951, he was a consultant for A. O. Smith Corp. and Waukesha Foundry Co.

Edwin A. Abott, for 15 years superintendent at **Hazard Wire Rope Works**, Wilkes-Barre, Pa., died June 23.

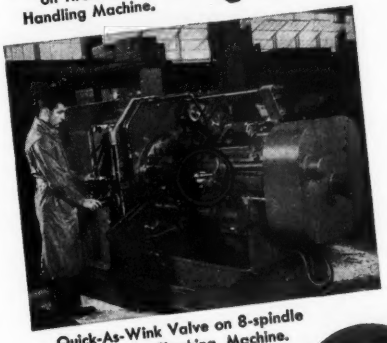
Walter N. Stevenson, 70, president, **S. & S. Hinge & Metal Products Co.**, Chicago, died June 24.

Quick-As-Wink Control Valves

Quick-As-Wink Solenoid Air Valves on Battery of Heavy Duty Presses.



Quick-As-Wink Valves on Tire Mold Handling Machine.



Quick-As-Wink Valve on 8-spindle Automatic Chucking Machine.

proven dependable performance that keeps you out of "post-mortems"

● The easiest and surest way of preventing break-downs, repair costs, material spoilage, machine damage, operator injury, lost production, customer ill-will — and their "post-mortems", is to install Quick-As-Wink Valves on *all* your air and hydraulic controls.

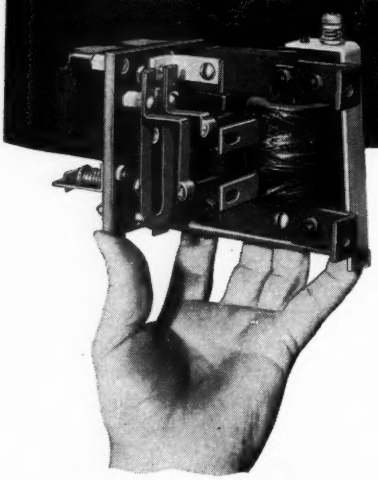
Positive and fast acting, every valve is designed and built to meet the most exacting requirements and individually tested before being shipped. All operating parts are in pressure balance eliminating any tendency to creep or crawl. Danger of "repeating"— major cause of accidents, break-downs and other trouble — is practically eliminated. Most foremen and superintendents know there's nothing better, for long, dependable, trouble-free service than Quick-As-Wink Control Valves. Can you afford to gamble with less?

Quick-As-Wink
AIR AND HYDRAULIC
Control Valves

Hand, Foot, Cam, Diaphragm and Solenoid Operated

Mfd. by C. B. HUNT & SON, INC., 1911 East Pershing St., Salem, Ohio

Independent *trips* save electrician's time in locating trouble



¾ rear view shows independent thermal and magnetic tripping elements—both are adjustable. Relay is front-connected, removable as a unit from the mounting-base.

When a motor stops, the electrician soon finds whether an *over-current* or a *fault* has caused the shutdown. EC&M THERMAL-MAGNETIC Overload Relays have independent thermal and instantaneous tripping elements operated from *one magnetic source*. Contacts are also independent with the instantaneous-element regularly furnished with hand-reset contacts. A quick look distinguishes between wiring trouble and motor overloading—*cuts downtime up to half*.

EC&M Type ZTM Overload Relays combine the *proven advantages* of *Thermal* and *Magnetic* tripping characteristics for complete a-c motor protection . . . increased life of motor insulation—elimination of useless tripping on harmless temporary overloads—minimized damage on faults. For certain enclosed motors with no inbuilt overload capacity, these relays are set to operate from 90% to 110% full load motor current to safeguard non-stop operation.

WRITE TODAY FOR NEW BULLETIN 1180-337

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Production AND Engineering NEWS AT A GLANCE

TITANIUM: FAST HISTORY—In four years titanium grew from a laboratory curiosity to a commercial metal. Howard T. Clark of Rem-Crum Titanium Inc. says that in 1948, when the metal was first put on the market, 2½ tons were produced; in 1950, 700 tons. Guess for 1952, 2000 tons. Current price of titanium sponge is about $5 per pound, about $12 per pound for simple forgings and as much as $25 per pound for sheet under some conditions. He says that while prices may come down, the metal will probably never be a common one like iron because it is hard to melt, and hard to fabricate compared to aluminum or brass. But for many applications, it is the best metal and its uses are increasing rapidly.

CAMERA AIDS STEEL RESEARCH—At United States Steel Co.'s research lab, high speed photography is used as a steel research tool. The lab uses a camera capable of speeds up to 3500 frames per second to find out what goes on in blast furnace combustion zones, open hearth tapping streams, piercing of seamless tubing, oil and spray quenching. Thus far, say U. S. Steel researchers, the many rolls of motion picture film have revealed much valuable data. p. 90

NICKEL EXTENDS BLADE LIFE—Propellers on seagoing aircraft now "live" longer. The reason: A method of applying a coating of nickel to the tips of aluminum alloy blades developed by Hamilton Standard Division, United Aircraft Corp. The new process, worked out with the aid of Bart Laboratories of Belleville, N. J., is expected to open up many applications previously considered impractical since it permits combining the hardness and corrosion resistance of nickel with light weight and other advantages of aluminum. Coating produced is a nickel-rubber composite that provides good resistance to erosion and corrosion with no concurrent damage to fatigue strength. Adhesion is uniform, and shear tests indicate that the nickel-rubber and rubber-aluminum bonds are very strong.

NEW LIQUID CARBURIZER—If you're trying to get consistent light and medium case depths on the work you are processing through your carburizing bath, the newest carburizer developed by E. F. Houghton & Co., Philadelphia, may be your answer. Field tested for better than a year and ready to go to work, the new liquid carburizer contains no salts which form insoluble compounds. It is completely soluble in water and no special handling is required to remove it from work surfaces. It also enables the bath to be operated at temperatures up to 1650° F, and no starting salt is required. Carbon content of the case formed by its use is characterized by lack of hypereutectoid or full eutectoid case. Cases produced quench out to full hardness.

ELECTRICITY DOES IT—In these days of hectic demands, production men often feel like throwing in the sponge. When they do find materials that meet specs they can't find the method to work them. But a new concept in the art of machining hard metals may break some of the bottlenecks. It's a spark machining process in which electrical energy is utilized directly in removing material from the workpiece—applicable to any conducting material. In the process, the work is flooded with a dielectric and is caused to assume a positive charge. Electrode or tool is charged negatively. Cloud of electrons flowing from the tool caused by bringing it close to the workpiece does the job. p. 92

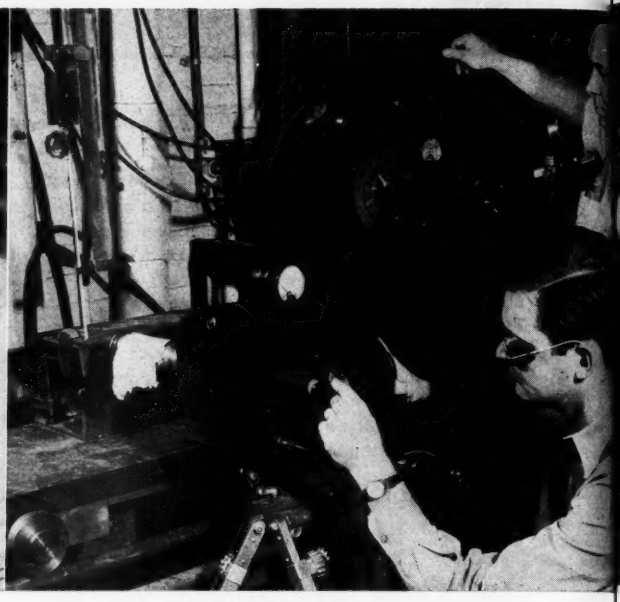
SUPER QUIET LAB—You can really hear the noise of a dropped pin in the soundless chamber unveiled recently by Westinghouse Electric Corp. to aid in researching for silent electrical equipment. A scientist wishing to locate the same sound conditions found in the chamber would have to go to a point at least a mile above the surface of the earth where there is nothing to distort sound measurement To make it a "graveyard" of sound, all six sides of the chamber are covered with glass wool insulation shaped like wedges of cheese 3 feet long. Apparatus to be examined is supported in the chamber by a flooring made of light, but strong cable mesh held in place by springs from the sides of the chamber. Instruments outside of the chamber are used to record what goes on inside.

MAY SOLVE RADIATOR PROBLEM—Engineers at Aluminum Co. of America report a new aluminum alloy brazing sheet which is expected to find immediate use in automotive radiator development. Core of the sheet is 3S alloy with one side clad with C43S brazing alloy and the other with Alclad, the latter providing electrolytic protection. Brazing material which is integral with the sheet forms good fillets and joints when used under proper brazing temperature and fluxing conditions. For constructing radiator cores, the dip brazing process appears to be the most desirable with the new material. p. 96

NEW METHODS, MORE NUTS—New production methods developed by Jacobson Mfg. Co. Inc., Kenilworth, N. J., enable it to turn out cold punched nuts at substantial savings. The company says conventional production rates prevalent in its type of industry was more than doubled, partly by using carbides and employing a concentrated cutting oil jet on threading operations. Nuts produced are of steel, brass and stainless steel.

Metalworking Outlook—p. 53 *Market Outlook—p. 155*

Quenching a hot bar of steel in oil is filmed by high speed camera using continuous flash illumination unit It produces 3 million lumens of light for 1 second



In the study of welding electrode characteristics a 4-inch lens plus closeup attachments are used to magnify the electrode image. Welding arc supplies illumination

TIME MAGNIFIED

High Speed Photography: Steel Research Tool

Blast furnace combustion zones, open hearth tapping streams, piercing of seamless tubing, oil and spray quenching, are some of the subjects studied by high speed camera

By R. A. BUCHANAN
Research Laboratory
United States Steel Co.
Kearny, N. J.

EIGHTY years ago a photographer named Edward Muybridge set out to make a series of still photographs to prove that at one stage of a horse's gallop all four hoofs are off the ground. His setup was a primitive one consisting of a row of 24 still cameras whose shutters were tripped by strings attached to the shutter mechanism and broken by the horse as he galloped by.

His results were successful and demonstrated that all four hoofs do leave the ground at one time, a motion which is much too fast for the human eye to follow. This simple experiment by Muybridge could be considered the forerunner of today's high-speed motion picture camera.

3500 Frames per Second — At United States Steel Co.'s research laboratory such a camera, capable of speeds up to 3500 frames per second, is being used successfully in many investigations. The camera uses 16 mm color or black and white film. When the camera is operated at its maximum speed, a 100-foot roll of film travels through the camera in approximately 1 second. Later, when the film is projected at the normal projection speed of 16 frames per second, the 1-second of action filmed required about 4 minutes to be viewed. Such tremendous time magnification allows research engineers to study carefully phenomena which could not possibly be seen with the human eye.

The high speed camera requires 110 to 115 ac or dc. A built-in 60-cycle argon timing lamp allows the actual speed of any given action photographed to be timed in absolute units by producing light impressions on the film edge denoting each 1/120 of a second.

Lighting Co-ordinated—Greater part of the work is in photographing self-luminous bodies such as the combustion zone of a blast furnace, welding electrodes and similar subjects. Many subjects must be illuminated by artificial light sources, such as tungsten or photo flash, so they may be photographed.

Lighting offers the most difficult problem in high-speed motion picture photography. Very intense light sources are required to allow proper exposure of the rapidly moving photographic film. At a camera speed of 3000 frames per second, for instance, each frame of the motion picture film is receiving 1/15,000-second exposure. To secure sufficient illumination, work-

High speed camera in place to photograph combustion zone of a blast furnace. Long rod is part of a water-cooled probe used to determine depth of zone

ers in this field use all types of lighting equipment ranging from photo flood bulbs to tremendous arc lights and even to aircraft searchlights.

Controlled Exposure — Proper exposure of a given subject is determined either by the use of an exposure meter or by past experience of the cameraman. Such experience is best recorded in the form of data sheets, one for each roll of film exposed, describing in detail the camera angle, lighting used, terminal speed of the camera, diaphragm opening, type of film used and special preparation of the specimen, if any. These data sheets serve as a reference for future work of similar nature.

An exposure meter of the photoelectric cell type, designed specifically for high-speed motion picture work eliminates trial and error. It is accurate for both color and black and white work.

Blast Furnace Probed—Most important contribution of the high-speed camera has been in the investigation of blast furnace combustion zones. This investigation was initiated in the hope that a better understanding of the combustion zone could be obtained by using a high-speed camera to "slow down" the characteristically violent action within the highly luminous field.

Kodachrome type A color film is used throughout. A slight modification of the tuyere peepsights allows a piece of silica glass 2 inches in diameter to be used as a window through which the camera can be sighted.

In the early work many of the films were either over or underexposed. It was difficult to understand why the exposures should vary so much, particularly since the same film, camera speed and diaphragm opening were used in each exposure. Assuming these factors to be constant, it became evident that the brightness was fluctuating considerably.

Light Intensity Varies—To determine how much the light intensity varied, a regular photographic exposure meter was used to record the illumination in terms of footcandles. The meter was held in place in front of the 2-inch glass opening and a number of readings were made over a period of 1 hour. The readings ranged from 25 to 250 footcandles. In one instance, the light intensity changed from 140 to 250 footcandles in less that 1 minute.

This simple experiment indicated that an exposure meter of some sort could be required for all future blast furnace work. A standard brand photo-electric cell meter was purchased and calibrated for high-speed work.

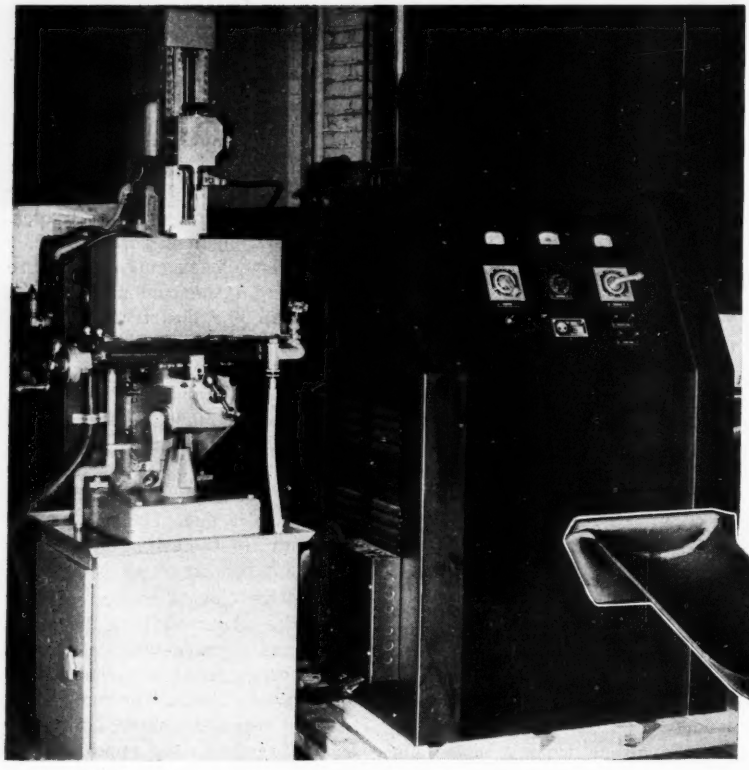
Taken Through Tuyeres—Valuable data have been derived from the many rolls of motion picture film taken through the tuyeres. Large and small angular particles being blown back and upward are observed in the combustion zone, the small particles traveling at a much greater speed than the large ones. It is evident, in viewing the films, that these particles vary in temperature, some of them being dark red or black in color whereas others appear to be bright yellow or white. The apparent brightness of a particle is due principally to its temperature, the bright ones simply being much hotter.

Positive identification of the particles observed in a normally burdened furnace was determined by photographing a furnace filled with a coke blank. The comparison of the two films showed virtually no difference in the appearance of the material in the combustion zone and therefore it can be concluded that the majority of the particles in this region are coke.

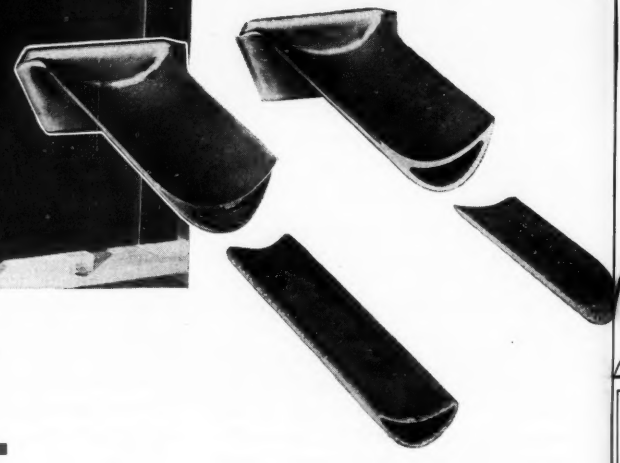
Glass-Sided Models — To study a cross sectional view of the combustion zone, which is impossible to do on the furnace, glass-sided models have been constructed. The high-speed camera is being used extensively in this investigation.

Blast furnace study is only one of the many subjects to which the high-speed camera is applied. We have successfully filmed welding electrodes, open hearth tapping streams, piercing of seamless tubing, oil and spray quenching and impact testing.

Today, high-speed motion picture photography is an especially important factor in its innumerable applications to arrested-motion analysis in science and industry. There are many applications for this medium. Analysis of the motions of intricate, very rapidly moving machine parts, effects of vibration, aircraft behavior, fuel injection, ballistic studies, air flow, explosions and metal cutting and forming operations are but a few of the subjects studied.



Latest model Method-X machine gives drastic speed improvement over former models. Power pack is at right



Slug from interior section of S-816 turbine blades was spark-machined. Left, hollow brass electrode used to drill blade on top. Right, finished blade and slug removed by a wire snare which serves as the electrode

SPARK MACHINING:

Meets Superalloy Challenge

Refinement of equipment and techniques make spark machining a versatile tool in the processing of tough-to-machine metals. Automatic controls simplify the job

By PAUL PORTERFIELD
Chief Engineer
Method X Co.
Pittsburgh

INCREASED use of titanium, S-816, vitalium, sintered carbides, in fact the complete family of superalloys as well as the more difficult to machine hardened steels, is presenting a severe challenge to American industry. In the past, use of such materials was somewhat curtailed because of the difficulties encountered in machining.

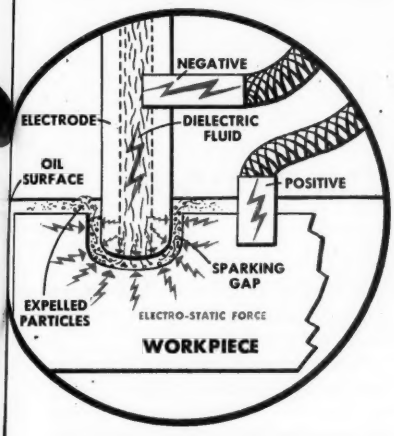
Production demands requiring minimum machine down time as well as the need for materials that will withstand extreme temperatures have caused increased activity in the field of hard metals. Designers and production men are faced not only with the problem of finding a satisfactory material for their application but in many instances with the question, "How can we fabricate the material that would be most applicable when normal machining methods do not apply?" In search of a possible answer to this question many engineers and their managements have turned to "Method X", a new concept in the art of machining hard metals.

Electricity Does It — In this spark machining process, electrical energy is utilized directly in removing material from the workpiece and is applicable to any conducting material. The work is flooded with a dielectric and is caused to assume a positive charge.

Electrode or tool is charged negatively and is advanced toward the work. When the distance between the workpiece and the electrode is small enough the dielectric breaks down and forms an ionized path that allows the charges to

neutralize. When this spark discharge occurs the excess electrons in the electrode rush through the ionized path in the dielectric. Since opposite charges attract, the electrons rushing from the electrode exert a pull on the protrons or positive charges in the work.

Electrons Rubbed Off—This effect can be demonstrated very simply by rubbing a hard rubber comb briskly with a wool cloth and holding the comb over some tiny bits of paper. Rubbing with the wool cloth has removed some of the free electrons from the comb and caused it to attain a positive charge. With the comb so charged and placed in close proximity to the tiny bits of paper, the pieces of paper will be attracted to the comb. If the comb is carefully brought near to the paper the tiny pieces can be made to stand on



Shaped electrode descends into workpiece, bombarding adjacent surfaces with controlled spark discharge. This action causes metal particles to dislodge and float swiftly away in the surrounding dielectric fluid

end. When the distance between the objects is still further reduced, the bits will jump toward the hard rubber and cling to it momentarily.

This force is the same force exerted by the electrons traveling toward the workpiece. The energy available from the circuitry associated with the Method X process is many many times greater than the forces exerted in the simple experiment just described.

At some finite point in their path toward the workpiece the cloud of electrons flowing from the electrode exerts a force on the workpiece that exceeds its tensile strength and as a result causes a small particle to break away. The force that can be exerted on the workpiece is a result of the instantaneous current or electron flow in the spark discharge.

Properties Unchanged—Work is performed without changing the physical or chemical properties of the machined piece.

Crystallographic studies of machined surfaces of material with transformation temperatures slightly above ambient have shown no evidence of crystal transformation. No indication of a change in temperature related properties such as surface hardness can be detected in the machined surface after processing.

It is not difficult to envision the application of spark machining to the formation of forging dies for production of turbine blades. After the blade is formed the same type machine that produced the dies could be utilized to remove a core from the blade section, a step that is often taken to provide a lighter blade, particularly in the blades that have a thick airfoil section.

Castings No Trouble—If the blades were cast again the process is applicable for the finish machining of interior and exterior surfaces. If the material that holds the root of the blade is difficult to machine, this same machine can produce the desired contour in the supporting material.

Extrusion of metals and plastics requires a study of the harder metals to reduce die wear and to assure the maximum footage per pound in the finished product. Utilization of these materials can be economically justified by the application of Method X in the fabrication of the die. In many instances where the irregular interior contour has required the use of split dies and all of their accompanying disadvantages, the use of spark machining has permitted the use of solid dies. This approach reduces die set up time and assures freedom from "flash" as well as the other well-known penalties that accompany the application of sectional dies.

Die-Holding Solved—In many instances in the production of a product utilizing the procedure discussed in the preceding paragraph, the problem of supporting the die becomes difficult.

Again, spark machining can come to the rescue of harried application engineers. The production of tapped holes in carbides was one of the first applications of this new machining process. This simplifies the die holding problem.

By virtue of the above facts tool and die designers now have available a tool that will allow a new approach to many old and difficult problems that have faced them. The industry, recognizing the possibilities offered, has quickly modified its design approach to make use of advantages now available.

If it is desired, for example, to produce a quantity of complex carbide nib tip shapes for a production project, cost of producing this irregular tip periphery should be less than 30 cents per piece. It is possible to stack a number of nibs and let one machine setup produce a quantity of tips without further attention from the operator.

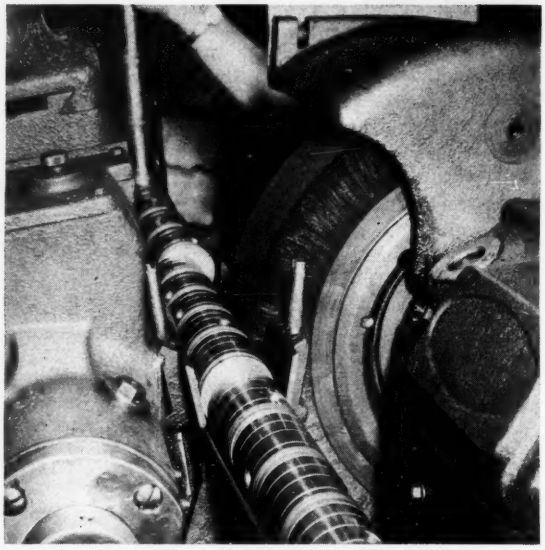
Automatic Controls—The Method X machine is equipped with an automatic control mechanism. The operator selects the desired conditions with reference to speed of cut, finish desired and electrode size. He then positions the workpiece and puts the machine in operation. Automatic control mechanism of the machine insures its performance according to the preset requirements.

Another Job for Cladmetal

Stainless steel clad on copper provides corrosion resistance and cooling efficiency in soda fountain dispensers. Report on the design by the manufacturer, Dole Valve Co., Chicago, indicates further application of American Cladmetals Co.'s Rosslyn metal type 430.

Cladmetal has stainless surfaces with copper sandwiched between. Copper conducts cooling temperature quickly; stainless provides sanitary surfaces. The steel contains no nickel alloy.

Nickel-alloy steel rods first are rough ground, then finish ground. Machine then is converted to a centerless brusher that puts final surface finish on the rod



Centerless brushing finishes pistons like these to micro-smoothness, removing grit, surface irregularities. Output of this machine is 10,000 piece per 8 hours

CENTERLESS PRINCIPLES EXTENDED

Grinding, Brush Finishing Done on One Machine

GETTING the workpiece into and out of the machine in the shortest possible time with minimum handling is one of the many problems confronting production engineers planning to use automatic or semi-automatic brushing machines at high production rates.

If this is your problem, and the work you are finishing is cylindrical, then a centerless brushing method developed by Osborn Mfg. Co., Cleveland, may be your answer.

What It Is—The technique is one that makes use of principles of centerless grinding; one that extends the use of the grinder to two jobs—rough and finish grinding, and final brush finishing. The conversion from grinder to brusher takes only a few minutes. The grinding wheel is replaced with a large diameter brush. Wire, tampico, or synthetic brush fill can be used, depending on the type of work and finish desired.

Although the method was engineered by Osborn primarily to meet needs of makers of precision parts, the company says it is employed for many other production operations. In one operation, for example, a centerless grinder is used for rough grinding, taking off 0.006-inch from the surface of nickel-moly steel rods used in pumps.

A finish grind operation takes off another 0.002-inch, and the machine is then converted to a centerless brusher.

Pits and Grooves Go—The action of the brushing is that of blending imperfections and surface irregularities rather than actual removal of metal. The result is that pits and grooves in the metal rods are blended into the surface.

The pump rods vary from 1⅛ to 1½ inches in diameter, and from 6 to 36 feet in length. Operation of the machine is relatively quite simple.

One man places the rod on the feed carriage. The regulating wheel, which runs at 52 rpm, is placed at a slight angle thus forcing the rod past the wheel surface. In a matter of minutes, the entire rod is brushed and is sent on to the next operation.

Pistons Smoother—Besides surface refinement, a centerless brushing method is aiding a manufacturer of pistons by removing the residue and sharpness of grinding to make subsequent handling and assembly easier.

A 20-inch diameter wire brush is used on the grinder. The brush has a 6-inch face and is made from 0.005-inch crimped wire. The pistons are machined, ground, then brushed. The work is gravity fed from a magazine type chute. A small driving wheel, set at an angle, rotates the parts and drives them through the brush area. The brush rotates at 1200 rpm. Over 10,000 pistons are finished in an 8-hour shift.

Another problem solved quickly was that of removing heat-treating discoloration and surface imperfections on tapered golf shafts. Due to the tapered "step-down" de-

sign of the cold-drawn heat-treated, high carbon, seamless steel shaft, it was a problem to get into the "step-down" corners.

No Surfaces Missed — This installation was engineered to use principles of centerless grinding, but not using a centerless grinding machine. A five-station machine is used.

The shaft is first hand fed into the lead station. A power in-feed keeps it moving until it passes the last brush. The first station breaks the discoloration, the others remove it, and finally finish the surface. Because of the flexibility of the brush, there is no "bridging" of the step-down corners.

With this method only one pass is required to turn out over 1500 shafts per 8 hour shift, or 10 feet of shaft per minute. In addition to high production, a uniform surface finish prior to plating is obtained. Sharp edges and groove-like marks produced in manufacturing operations tend to build up relatively high current densities and as a result, the plating tends to emphasize the surface irregularities. Brushing eliminates this fault by removing the coarse, surface roughness.

Blast Cleaner Speeds Casting Flow

CASTING-CLEANING room bottleneck is opened at Eclipse Lawn Mower Co. by a rotating table blast cleaning unit employing centrifugally hurled abrasives.

The Prophetstown, Ill., firm says an expanding production line forced faster handling in the casting-cleaning phase of operations. Work with the new unit results in 3000 mower parts being processed each four-hour shift. This, reports Eclipse, cuts 29 man-hours off the cleaning time required previously.

Two-Man Operation — Cleaning table, made by Pangborn Corp., Hagerstown, Md., is operated by two workmen. One places castings on the continuously rotating table. The other takes them off after they have passed under the blast stream.

In four hours these men clean 800 lawn mower wheels, 1200 side plates and 400 cutter bars. Wheels are 8½ inches in diameter and weigh 4½ pounds; side plates are about 8 x 12 inches and weigh 4¾ pounds; and cutter bars are 3 x 25 inches and weigh 6 to 10 pounds.

Reaches Deep Pockets—Cleaning table consists of a 9-foot diameter rotating table, carrying six 36-inch tables that rotate about their own axes. Operator places castings on each of the smaller tables. The larger table carries them through heavy rubber curtains into the enclosed blasting chamber where the abrasive stream bombards the work from a 45-degree angle.

In addition to increased processing speed, Eclipse indicates other advantages found in the cleaner design. Rotation of the castings on the smaller tables means that the stream can reach deep pockets. It covers contours and multisurfaces with great cleaning efficiency.

Dust Control—Improved conditions for workmen result from a dust control unit made to draw dust from the cleaning table before particles enter the atmosphere.

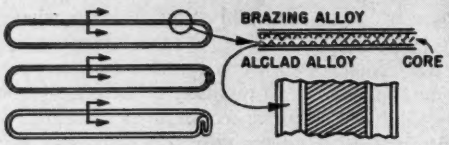
To make this control function with a minimum of interruption to regular processing operations, Eclipse designed a special dump-cart equipped with mower wheels. Cart is rolled under the hopper, valve opened and collected dust wheeled away for disposal.

Ultrasonic Machining Reviewed

Machining metals by electrical and ultrasonic processes is the subject of an article in the current issue of *Technical Reports Newsletter*, published by Office of Technical Services, Washington. Other material of interest to shop men includes reports on a new light metal die stamping process; high speed milling and reaming; gaging and measuring screw threads; and dust control in iron foundries.

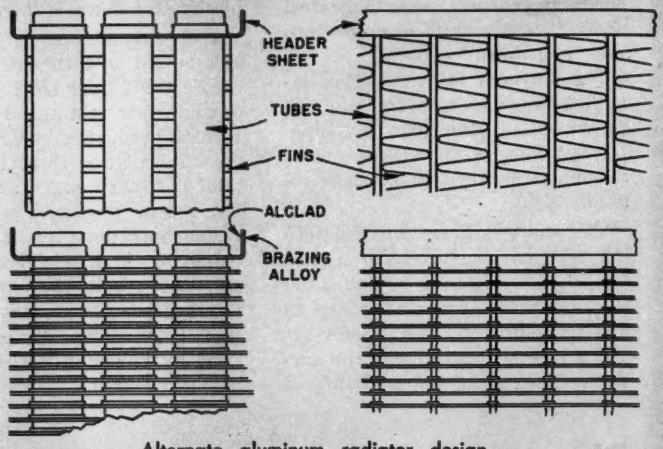
One workman places the mower castings on the continuously rotating blast cleaning table; the other collects clean ones as they move out from the blast chamber

Castings on six small tables are carried by the larger table through the blast stream. A small table carries ten wheels, nine side plates or eight cutter bars



Drawing showing tube construction. Top to bottom: Seamless, lap seam and lock seam. At right are shown tube wall section and tube section

TEAKETTLES TO GAS BUGGIES



Alternate aluminum radiator design

Aluminum Brazing Sheet Used in Radiator Studies

Experimental work on aluminum automobile radiators will get a big lift from Alcoa's XA30 brazing sheet. 3S alloy core has brazing alloy on one side, Alclad on the other

ENGINEERS at Aluminum Co. of America have developed a new aluminum alloy brazing sheet which is expected to find immediate use in automotive radiator development. The XA30 brazing sheet has a core metal of 3S alloy. One side of the core metal is clad with C43S brazing alloy and the other side has an Alclad coating which gives electrolytic protection to the core.

Units Dip Brazed—Based on Alcoa's research and development work, the dip brazing process appears to be the most desirable means for constructing radiator cores. Chief advantages of dip brazing are controlled temperatures in the brazing range and the elimination of a separate fluxing operation. Usually the process involves a brief degreasing operation with trichlorethylene (vapor degreasing), carbon tetrachloride or similar solvents. Castings or heat treated material should be chemically cleaned.

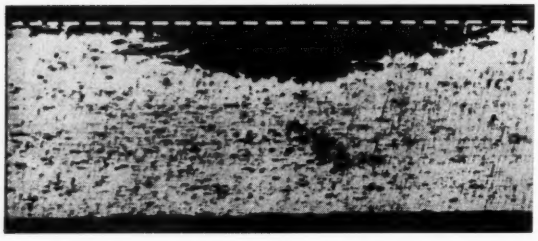
After cleaning, the assembly is preheated to 950-1000° F. Then the unit is dipped in molten flux at the proper brazing temperature. Normal brazing temperatures range from 1085 to 1190° F. Length of time in the dip furnace depends upon the particular unit involved.

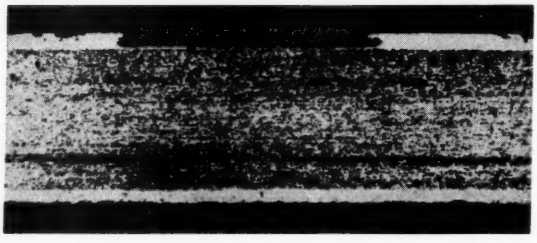
When joining is finished operator removes the assembly from the furnace and drains the residual flux. As soon as air cooling permits, the unit is given a hot water rinse (180-200° F) followed by immersion in a nitric acid cleaning solution and a final cold water rinse.

Wire or Sheet—Brazing material for dip brazed assemblies is available in the form of wire, sheet or a specially clad material known as brazing sheet. XA30 brazing sheet with a core alloy of nominally high melting temperature is clad on one side (outside of the tube sheet) with a lower melting point brazing alloy. Melting range for 3S (core metal) is 1190-1210° F while the melting range for C43S (brazing alloy) is 1070-1135° F. Brazing range for the composite XA30 brazing sheet is 1120-1140° F. Brazing material which is integral with the sheet forms good fillets and joints when it is used under the proper brazing temperature and flux conditions.

Corrosion Curbed—Second side of the brazing sheet (inside face

Cross-sections of 3S-H14 (left) and Alclad 3S-H14 (right) sheet after exposure to sea water for a period of 22 months. X30, 5 per cent NaOH





of the tube) is an Alclad coating which gives electrolytic protection to the 3S core metal. Whatever corrosion takes place goes only as far as the core and then spreads out. This action arrests further penetration.

A problem of this kind was met many years ago when the service of aluminum teakettles in some geographical areas was impaired through a pitting type of attack. An aluminum-zinc alloy cladding was developed and applied to the sheet stock for teakettles. This product effectively eliminated an otherwise difficult problem in handling fresh water at elevated temperatures throughout the country.

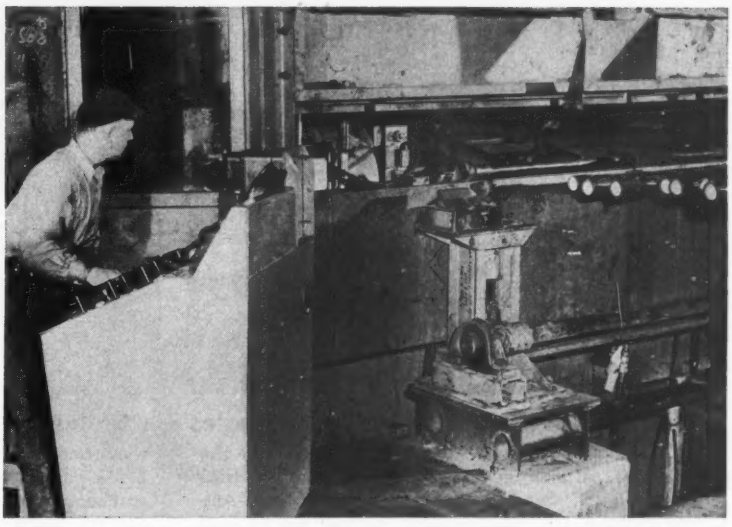
Problem of developing suitable electrolytic protection for radiators, however, was complicated by the high temperatures over varied periods of time which are required for brazing. Using the knowledge and experience gained in the teakettle problem, Alcoa developed the radiator cladding along similar lines.

Good Test Results—Several different corrosion test methods have been used on the new brazing sheet. Accelerated corrosion tests were run and solution potential measurements were made with synthesized waters simulating the water of special areas of the country which might cause attack in aluminum radiators. Tests were conducted with water only and then with each kind of water in combination with varying percentages of antifreeze compounds.

One water formulation had a significant concentration of heavy metal salts. Another had a relatively high chloride content.

Tests indicate that corrosion by these coolant mediums was not critical in XA30 brazing sheet.

More Answers Needed — Other problems remain to be solved before aluminum will be accepted as the standard material for automotive radiator construction. Questions which cannot be answered now because adequate service trials have not been completed are: Will an inhibitor with coolant waters of different areas be necessary? Will an exterior paint coating be necessary to protect the radiator against road splash? Alcoa's development engineers are working on these problems.



Stresses up to 80 per cent of yield strength can be applied by the automatic tester. Filling end test head is moved by double acting cylinders

Pipe Tested on Production Scale

Simulated service tests for pressure capacity of pipe are done at the point of manufacture. Uncertainties of predicting performance are eliminated

PRESSURE testing of pipe is failure insurance to the customers of Spang-Chalfant, division of the National Supply Co. Oil well tubing and casing that may be subjected to high pressures in use can be subjected to pressures up to 10,000 psi by test equipment installed at the company's Ambridge, Pa., plant.

Simulated service tests, made on a production scale at the point of manufacture eliminate uncertainties of predicting pipe performance on the basis of visible surface conditions.

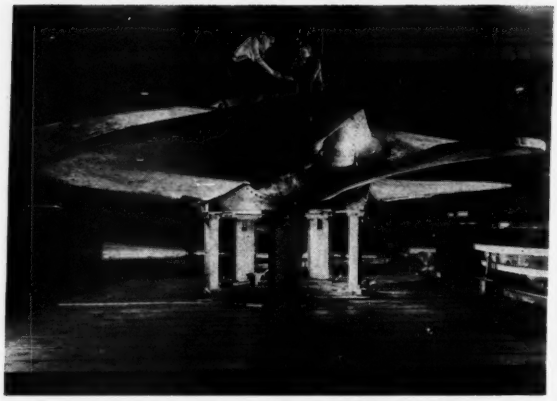
Chain Reaction—Automatic operation is a feature of pressure testing equipment of this size and capacity. The different phases of the test follow successively after pressing a single button. Each operation can be activated by individual controls also. When holding test pressure for the normal period of 5 seconds, tests may be run at the rate of 120 per hour.

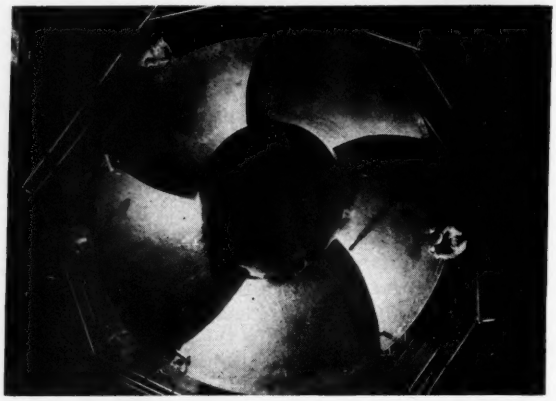
The test bench, built by Hydropress Inc., is 86 feet long. Foundation for it and accessory equipment is 112 feet long and 42 feet wide at one end, with water sumps 13½ feet deep. Height over the enclosure is 11 feet.

Built-in Safety—Protection for the operator and other workmen near the tester is provided by the enclosure and by elevating doors on both inlet and outlet sides. Interlocking of controls permits pressure in the pipe only when doors are closed and permits loading and unloading only when doors are open.

Pipe enters the test bench on the operator's side. It is then lifted and rolled into V-blocks on prespaced clamping carriages. Clamps on the carriage nearest the far test head close first permitting air cylinders to pull the pipe into the far test head. A switch trips to close other carriage clamps and the enclosure doors. It is filled with water under 100 psi air pressure in a 710-gallon water tank. A filling timer then closes the valves and high pressure water is admitted from intensifiers. This pressure also serves to tighten the sealing rings.

Pressure is normally held 5 seconds before release. Valves are then opened and the main ram re-





Flower or Mushroom?—Different Angles on a Kaplan Runner

Huge Kaplan propeller-type water wheel runner looks like a cross between a flower and mushroom when seen from different angles. Shown in process of assembly at Allis Chalmers' shops, the 200,000-pound member will be used with a hydraulic turbine being completed for TVA's Pickwick Landing Plant. Runner's diameter is about 24½ feet. Blade pitch is shown at left. These, with the hub, are cast separately of steel. Each of a total of six hydraulic turbines made by A-C for the power project develops 55,000 hp, is built with a 48-foot head, moves at 81.8 rpm

turned. Clamps are released except the one that opens after withdrawing the pipe from the far test head. The doors open, the pipe drains, and is removed from the bench by kick-out arms on each carriage.

Coating Extends Pipe Life

Porcelain enamel ups black steel pipe life 12 to 20 times in aluminum fluxing

BLACK STEEL PIPE savings worked by use of porcelain enamel coatings amount to about 2 million pounds after 18 months of operation in fluxing and degassing aluminum alloys. The enameling process increases average pipe life 12 to 20 times in this application.

Work on the process was done by Barrows Porcelain Enamel Co., Cincinnati. The firm acted on a request from Reynolds Metal Co.'s Listerhill, Ala., plant for a protective coating of ceramic material that would extend pipe service life in a chlorine fluxing operation.

Reynolds reported average chlorination tube life was 8 to 10 minutes. Initial cost of a 6-foot length of 1-inch pipe ranged from 75 cents to $1.50, forcing a disproportionate part of total expense to be directed for this item.

Apparent Impasse—High pipe mortality rate was attributed to two factors: Naturally destructive effect molten alloy had on the raw iron pipes; deterioration by chlorine-supported combustion at high temperatures. In addition, contamination resulted when black steel pipe and chlorine gas combined at high temperatures.

Chlorine was considered necessary despite its destructive power because the alloy was subjected to rigid specifications. Black steel pipe was determined the only practical metal that could be used for high temperature fluxing. Barrows believed porcelain enamel's heat and corrosion resistance could be applied to overcome this apparent impasse.

Interior Application—One problem during preparation of a suitable coating was choice of an acceptable process for applying the enamel. Pipes used for chlorination in some cases were 14 feet long. There was a 45-degree bend about 24 inches from the exhaust end of the 1¼-inch ID pipe. This made interior application a major bottleneck.

Answer was found when one end of the pipe was closed, the slip allowed to fill the erect pipe completely and run off slowly. Result was an almost perfect coat, necessary because it was impossible to inspect the inside of the bent piece without cutting the pipe itself.

After pipe was coated, it was fired at 1300° F to 1900° F. Initial coating supplies the bond between the metal and one of several finish coats. The latter is applied by a similar closed-pipe method.

Cost Limitations—After perfecting a coating method, there remained the factor of achieving the best enamel within cost limitations.

Regular high temperature resistant enamels, such as those used in jet engine parts, failed in initial tests because of inability to resist corrosion caused by molten aluminum. In addition their fusing temperatures are so high that commercial enameling production equipment is not generally found in their firing ranges.

Barrows hit upon an acceptable product first by adding various refractory materials to high corrosion resistant coatings so coating resistance to heat would be increased. Then, in a direct opposite to this approach, the company altered the character of finishes with high heat resistance to produce improved corrosion resistance.

Average Life: 148 Minutes—After final tabulation, the firm indicates that average life of the most suitable porcelain was about 148 minutes. This is compared with an original 8 to 10 minute life expectancy of the uncoated pipe. Coated pipe cost about five times as much as the plain material, leaving savings considered satis-

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factory by the Reynolds company.

Barrows adds that additional black steel pipe savings are possible by use of other, more expensive coatings. They testify, however, that additional costs are not warranted, because rough plant handling frequently results in a rough breakage ratio.

Lead-Bearing Steels Announced

Two new lead-bearing steels are announced by La Salle Steel Co., Hammond, Ind.

The first, Super La-Led, is available now in limited quantities. It is a free-machining open hearth steel, containing about one-quarter per cent lead and one-half per cent sulphur. Company reports this is the highest sulphur content of any U. S. commercial steel.

In addition to regular steel applications, suggested uses include supplementing brass stock. This usually produces a workable part at lower cost, says the company, but is possible only where brass has been used primarily for its machinability and corrosion is not a factor.

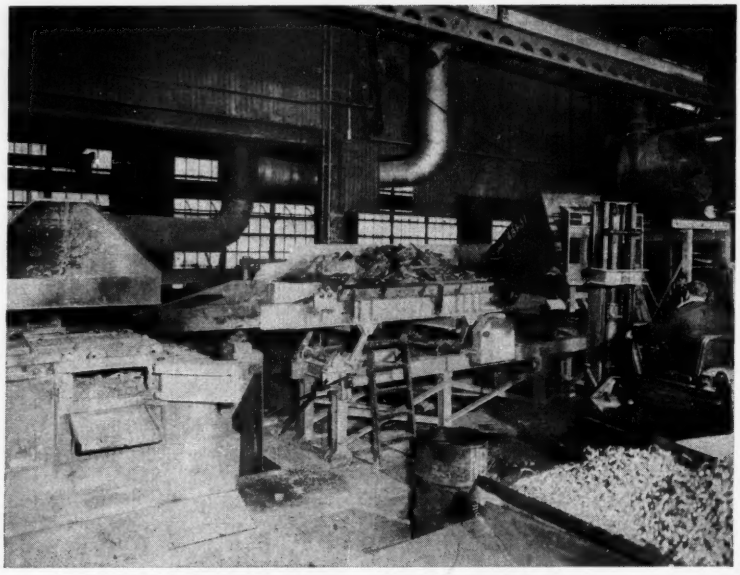
Leaded TS 4140 Modified is the second product introduced—a lead-bearing alloy with improved machinability through addition of lead. La Salle reports this steel will machine about one-third faster than the comparable non-leaded grade. Company also says heat-treating characteristics, hardenability and mechanical properties are not affected by lead addition.

Both steels are available cold drawn in various size ranges, in rounds and hexagons.

Unit Takes 1000-amp Loads

Motor Generator Corp., Troy, O., reports it is making a new self-propelled ground power unit designed especially for aircraft requiring maximum 1000-amp loads. The firm says its model fills a dual purpose, functioning as a standard self-propelled vehicle for reaching the airplane quickly, then as an auxiliary ground power unit to take over the plane's power load.

Power is supplied by a Chrysler V-8 engine. It provides constant voltage, 28½-v direct current, for checking out aircraft and starting engines.



FURNACE FEEDING BY OSCILLATING CONVEYOR
. . . advantages include uniform flow and reduced loading time

Induction Furnace Feeding Conveyorized

Revere's oscillating conveyor reduces loading, gains uniform flow by taking an entire batch of brass mill scrap, chips and shavings at one time

AMONG ADVANTAGES accruing from installation of an oscillating conveyor to feed a large capacity induction melting furnace at Revere Copper & Brass Inc., New Bedford, Mass., are uniform flow of material and reduced operator loading time.

An entire furnace batch of brass mill scrap, chips and shavings can be loaded on the conveyor at one time, freeing the operator for other duties.

Protective Cushion—Lightweight shavings and chips are loaded onto the conveyor first, near its discharge end. These form a cushion that protects furnace lining from heavier scrap weight, loaded last near the rear.

Total weight of a charge may be in excess of 2½ tons. Through the oscillating action of the conveyor, the concentrated load of scrap becomes a uniform continuous flow to the furnace.

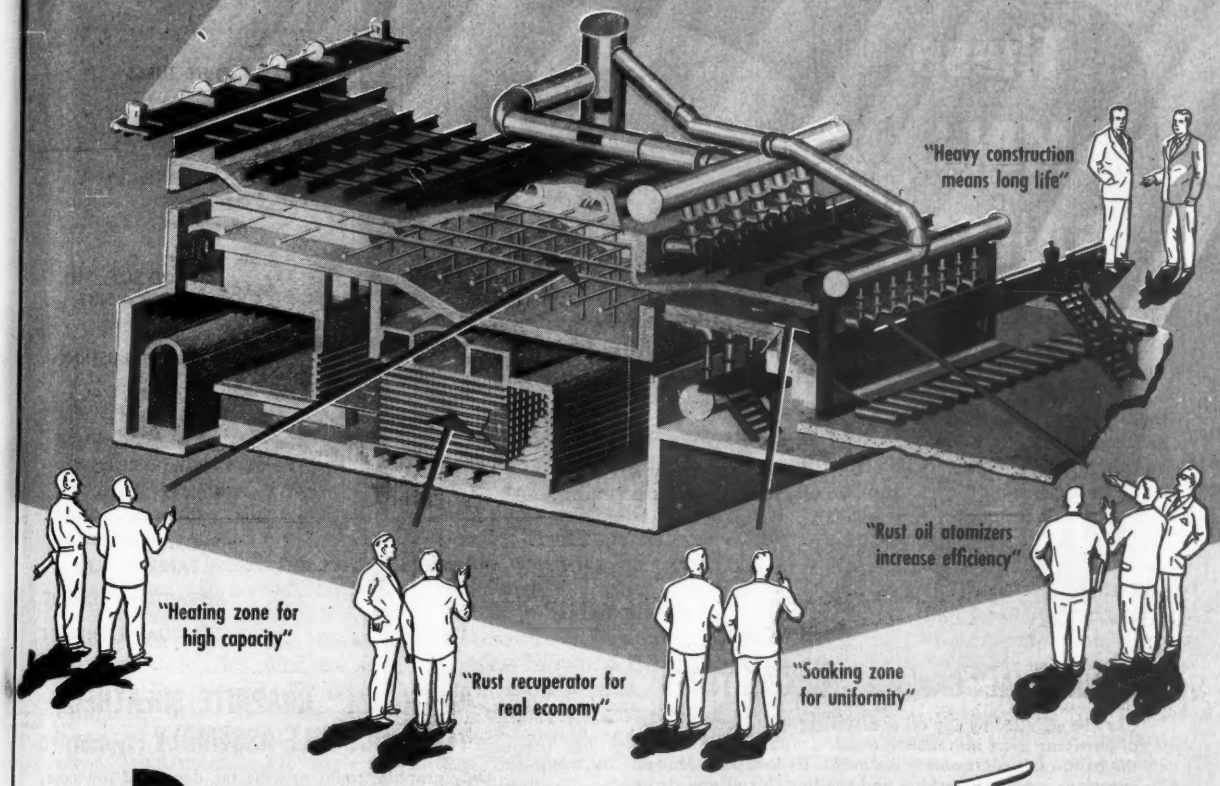
Gentle Travel—Conveyor is 20-feet long, with a seamless U-shaped trough ⅜-inch thick, 42-inches wide, mounted on inclined lever arms that articulate with torsion bar springs. Actuating mechanism is driven by a 5-hp motor and Link Belt electrofluid drive through a v-belt reduction to a heavy-duty positive action eccentric drive.

Heavy surge loads can be handled without reduction of stroke or conveying action. Each revolution of eccentric drive mechanism causes an upward and forward motion of the trough resulting in a gentle, forward travel of the material.

Drive Forces Minimized—Torsion bars serve as reactor springs to absorb energy of trough movement at each end of the stroke at all points of support along the trough. Since the trough operates at the natural frequency of the torsion bar springs, forces exerted on the drive are reduced to a minimum.

A chute extension at the discharge end of the conveyor pivots upward and out of the way so the furnace can be tilted for discharging. Conveyor is a product of Link Belt Co., Chicago.

FURNACE MEN KNOW THEY'RE BETTER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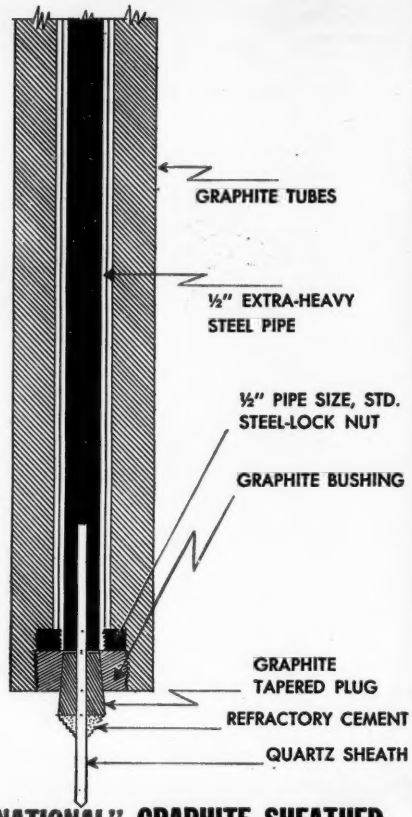

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CURBS PRODUCTION LOSSES

Coke Plants Explosion-Proofed

Roof ventilators at by-product building, segregation of hazards, explosion-proof electrical fixtures, cleanliness, proper maintenance and drainage are factors of safety

By CARL F. STISSEL
Alexander & Alexander, Inc.
Chicago

FAVORABLE construction in coke plants comprises light, all-steel or asbestos on steel frame for the coal handling buildings. Other buildings, especially the by-products building and those of the light oil plant, should be of fire-resistive construction and should have masonry walls and reinforced concrete roofs and floors, with all steel work protected by adequate concrete to fireproof it. All outside equipment, such as tanks, scrubbers, and coolers should be of all-steel construction. All parts of such tanks including interior supports should be completely noncombustible. Where there is a choice of materials for the trays or hurdles inside of scrubbers, noncombustible type of interior equipment should be used if it can be fitted into the process.

Where there are wooden roofs on existing buildings or any type of wooden supports, good practice now calls for the installation of automatic sprinkler systems.

Involves a Hazard—There has been a tendency at times to use asphalt protected metal in place of ordinary corrugated iron. From the standpoint of resistance to chemical action, the advantage lies with the asphalt covered metal. So far as fire hazard is concerned, there is a distinct disadvantage to the use of this material. A recent fire occurred in a coal conveyor of a steel mill. This conveyor was elevated on a steel structure and was enclosed with asphalt protected metal. Fire of unknown origin spread rapidly and with intense heat along the melting asphalt and quickly caused the collapse of the entire conveying structure.

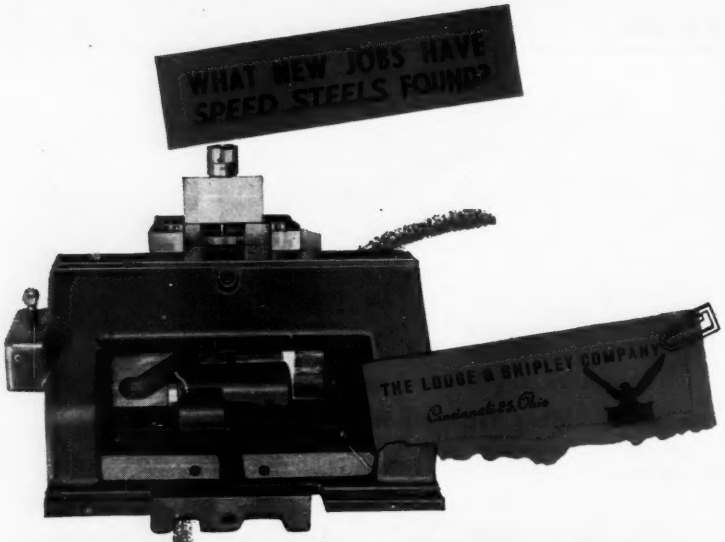
Buildings in which there is an explosion hazard should be constructed in a manner to make it possible to relieve the pressure set up by an explosion. By their general nature, coal preparation plants usually provide for this feature. The buildings of the by-product and light oil plants, which frequently have masonry walls, should be equipped with large size roof ventilators and should be ventilated by windows which open automatically. Where such windows are dependent on automatically operating fasteners, corrosion of these fasteners may make the windows inoperative. Glass sash which has been scored with a glass cutter is usually more effective than mechanical devices because the glass is likely to break before there is an explosion. It is suggested that the scoring be in the shape of a "double hour glass". Strangely enough after about five years the scoring may be "healed" and the glass will have to be scored again.

Segregation Pays — A cardinal principle in fire prevention and protection is the segregation of hazards. Where the benzol plant is separated from the remainder of the plant by 200 feet or more, there is little chance of damage to other units of the plant when there is a fire or explosion in the benzol plant. It is possible, however, that further reduction of hazards can be secured in existing plants by dividing large buildings such as those of the by-products plant into smaller fire divisions. This preferably should be done by the erection of solid brick fire walls. Because of the possibility of escaping gas causing an explosion, there should be no openings in such fire walls. Where explosion hazards do not exist, openings in fire walls are permissible, provided standard fire doors are installed at the openings.

One important feature in dividing by-products buildings into two or more fire areas is that by so doing, areas which require explosion-proof electrical equipment can be kept separate from those which do not. If water pumps, tar pumps, liquor pumps, wash oil pumps, and lime solution equipment are located in the same fire area with exhausters, they would require explosion-proof electrical equipment. However, in a separate fire area less expensive, ordinary electrical equipment would suffice.

Outside equipment such as storage tanks and process equipment should be separated as far as practical from plant buildings. Where such equipment or tanks contain hazardous materials, and must of necessity be located closely adjacent to buildings, it is desirable to have blank masonry walls facing the outside equipment.

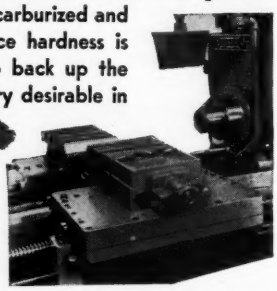
Electrical Equipment—The principal units of a coke plant wherein exist marked explosion hazards



"SPEED ALLOY STEEL PLATE WELL SUITED FOR CAMS"

—That's the opinion of Lodge & Shipley Co., Cincinnati, Ohio, who are successfully using Speed Alloy hot rolled alloy steel plate for the cam plate of the cam-operated rear cross slide on their famous "2A Duomatic" Lathe. They state:

"Speed Alloy was selected for the cam plate because it is particularly suited for cams. A considerable saving in machining time has been found over other suitable steels. Definite figures are unavailable, but the savings are probably in the order of 10%. The cam slot is carburized and heat treated to 50-55 Rockwell C. This surface hardness is readily attainable, with good core hardness to back up the case. Reduced distortion of Speed Alloy is very desirable in this part . . . distortion from heat treat has been no problem."



Speed Alloy has cut costs for many producers of molds and zinc die casting dies and on a variety of machine parts. Maybe it's the answer to your problem. Check with your Speed Steels Distributor.

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A COLUMN of mercury one-tenth the breadth of a human hair is at the heart of medicine's most commonly used diagnostic tool—the fever thermometer.

Only 80 years ago, when London doctors got their first look at one, it was an object of amusement to some of the most learned members of the profession, says Steelways.

Much of the work in manufacturing the instruments today is done by hand. At Taylor Instrument, Rochester, N. Y., women are trained for a year to perform an operation that requires them to make passages in the glass that measure only 0.0006-inch. This is done without gages of any kind.

should be equipped with the type of electrical equipment specifically required for the particular hazard. This means that in the coal preparation plant and the coke screening and crushing operation lights and motors should be dust tight.

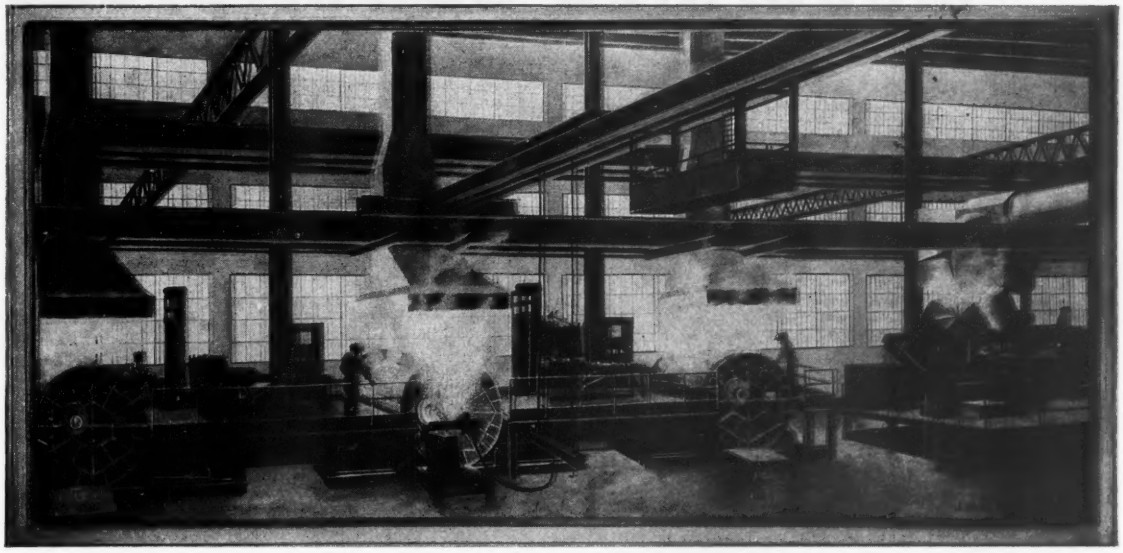
In both the by-product plant and the light oil plant, electrical equipment, including lights and motors should be fully explosion-proof and the equipment approved by the Underwriters' Laboratories. In the case of lighting, the explosion-proof fixtures should be used for new installations. Where old existing installations are equipped with formerly approved vapor-tight globes, a change to explosion-proof would not ordinarily be recommended.

Once the equipment is installed the plant should be operated in such a manner that explosions or fires do not occur. To do this properly everyone from top management down to the laborer in the yard must consider fire and explosion prevention as a personal responsibility. Employees should be chosen not only because they are able to operate certain machinery or equipment but also because of their ability to understand the hazards involved. These employees should be trained with great care and given full knowledge of the hazards which are involved and what to do under all circumstances.

Factors of Control—By means of perfect maintenance of equip-

AJAX

Induction Melting Furnaces— A Modern Tool for Industry



This oil painting, 9 feet long in full color, by J. Gordon White, shows AJAX-SCOMET installation at Scovill Manufacturing Company, Waterbury, Connecticut

Here is a new tool for melting metal. . . . Something that can concentrate enormous power in a small space. . . . Something that can be adapted to accurate pouring, to precise temperature control, to inert gas protection, to high-grade refractories. . . . A tool that can be used for all existing non-ferrous metals and alloys.

AJAX furnaces paved the way for continuous casting processes which lay dormant in old patents of farsighted inventors who thought ahead of their times. Junghans, with the help of the AJAX furnace, developed his continuous casting process at the Wieland Works in Germany before the last World War.

Scovill perfected the Junghans process in this country and is using AJAX-SCOMET furnaces of unprecedented sizes for melting, as shown in painting above. Nichols Wire & Aluminum Company used the first commercial Properzi machine for continuous production of aluminum wire from molten metal delivered by AJAX furnaces; U. S. Metals Refining Company is using AJAX-SCOMET furnaces for continuous casting of oxygen-free copper. Cleveland Graphite Bronze Company produce their famous stock for steel backed copper-lead bearings exclusively in AJAX melting furnaces. Hunter Douglas Corporation, Riverside, Cal., use AJAX furnaces for continuous casting of aluminum strips for venetian blinds. AJAX furnaces are used in many plants and research laboratories for continuous bonding aluminum to steel.

AJAX made the first furnace for galvanizing steel in a refractory lining with accurate temperature control. AJAX furnaces were instrumental in the realization of modern squirrel-cage aluminum rotor production. AJAX supplied the first commercial automatic pouring device for die-casting machines.

These few examples show how AJAX induction furnaces can be applied to modern manufacturing methods. Write us for further information.

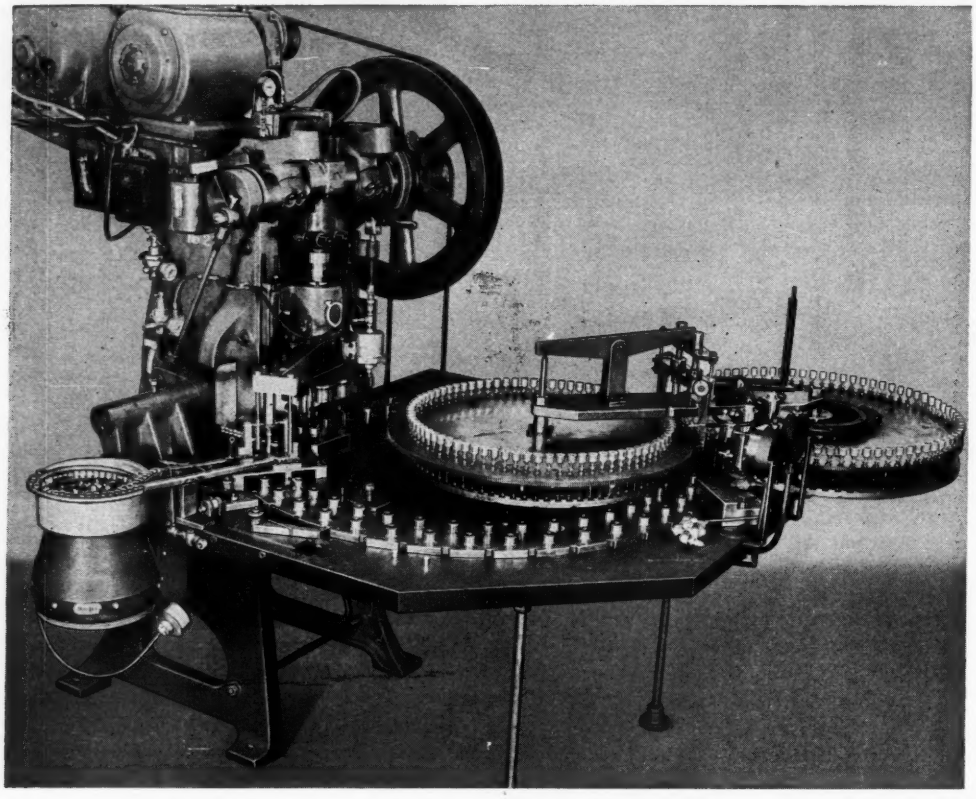
AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX TAMA-WYATT

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax-Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting

How V&O is Helping *modernize power press*

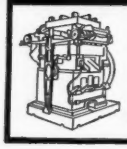


V&O Dial Feed Produces Batteries For P. R. Mallory

All of the operations involved in assembling small batteries are performed on this V & O Dial Feed, including application of hermetic sealing compounds. Affording a compact and integrated method of production, this Dial Feed is an example of the advanced type of power press tooling V & O is equipped to engineer and build.

V & O Dial Feeds may provide just the techniques you need to improve metal stamping or parts assembly operations. It will pay you to investigate what these feeds can do to save motion and space . . . combine assembly operations, overcome shortages of skilled personnel and reduce costs of small parts manufacture.

OTHER EMHART PRODUCTS INCLUDE:



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Division of Emhart Mfg. Co.

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GLASS MAKING MACHINES

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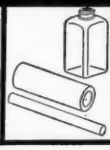

PLASTIC BOTTLES, RODS, TUBES, SPECIAL SHAPES

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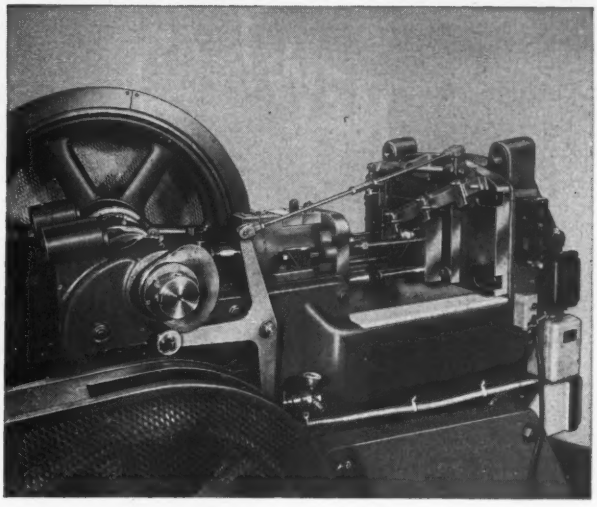
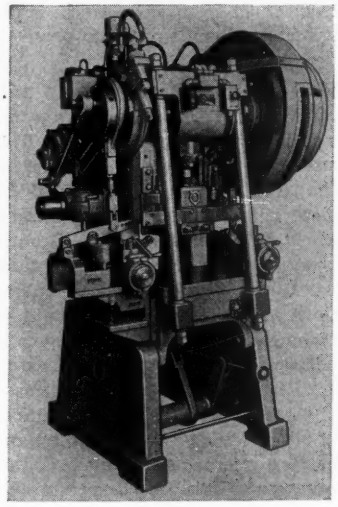
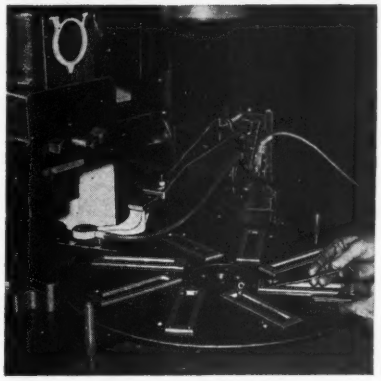
Leading Companies *operations*



On Its Back, this V & O press provides a "cushioned" method of sizing sintered bronze bushings, avoiding the hazards normal press operation would present for a part of this type. It is easier to get parts in and out of the press.



New High Speed Press, latest in V & O line, features maximum rigidity and minimum vibration. It is designed specifically to meet today's need for precision metal stamping at highest speeds.



Production Increases in secondary dieing operations, ranging from 28% to 500%, are reported by companies employing the V & O Feed-O-Matic® — the mechanical punch press feeder that lengthens die life, simplifies operator motions and improves safety.

Only the best is good enough

DESCRIPTIVE CATALOGS Catalogs containing complete specifications and operating details on V & O Precision Power Presses and Feeds are available. Please write The V & O Press Company, 381 Union Turnpike, Hudson, N. Y.

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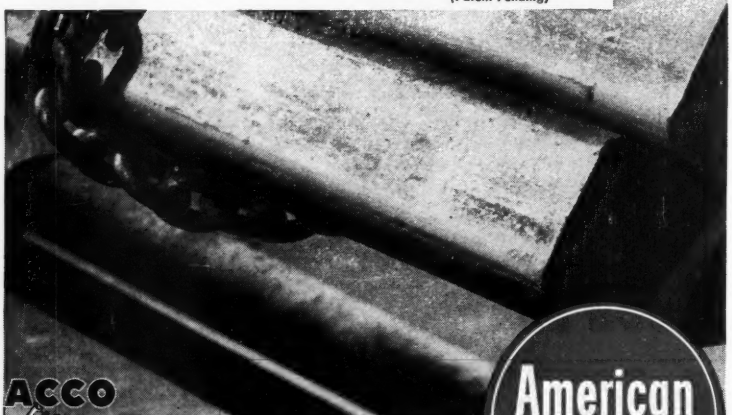

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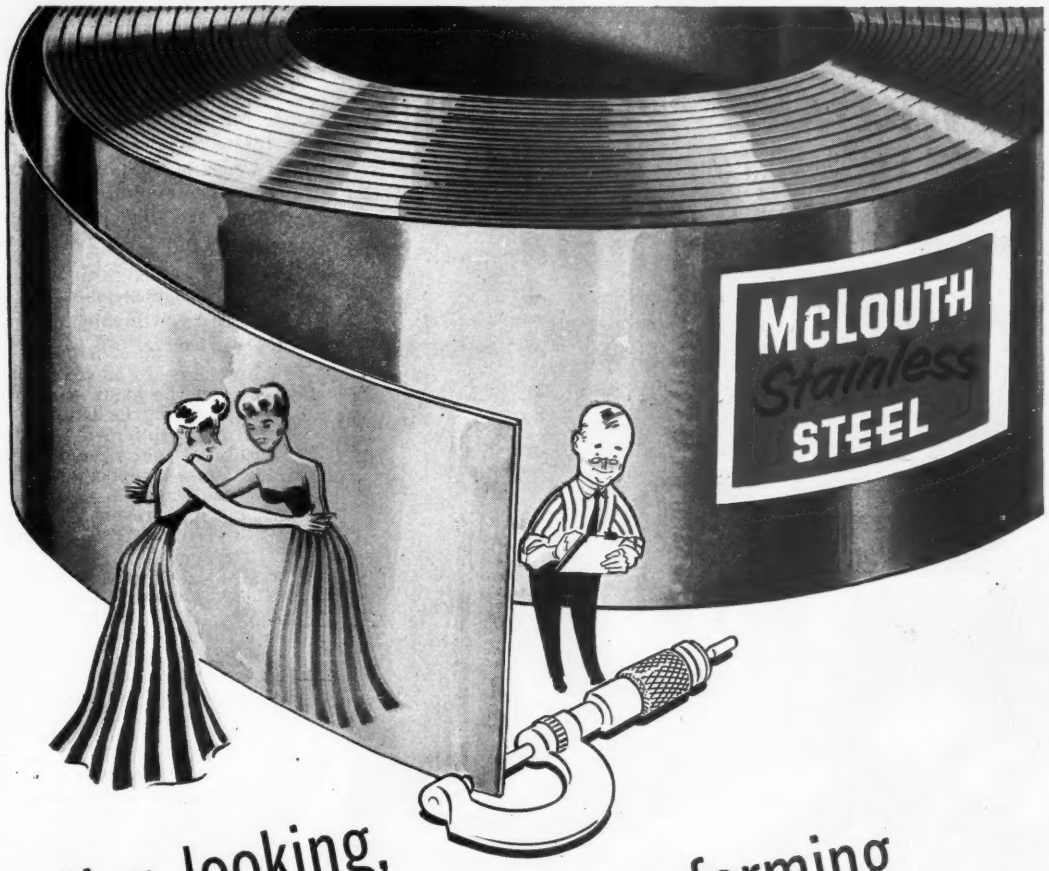
Doubling up Drum Storage

Special pallet developed at the Westinghouse E. Pittsburgh plant raises outside drum storage capacity by 100 per cent. The firm uses a Baker-Raulang truck to carry four drums on a pallet made with wood stringers that keep drums in place. Truck stacks four high, laborers could go only two

ment and eternal vigilance to prevent leaks, the hazards of a combustible gas can be controlled. The hazard of the combustible dust in the coal handling plant can be materially reduced by maintaining excellent cleanliness. Ground clamps should be used when tank trucks are being filled. All operations in hazardous areas should be rechecked periodically in order to eliminate possibilities of disaster.

The past years have witnessed a steady increase in the number of fires resulting from welding and cutting operations in manufacturing plants. It is, however, desirable to re-examine the procedure from time to time. The equipment on which the work is to be done must be carefully prepared. All combustible materials should be completely removed. In the case of piping, tanks and other equipment, there should be purging by steam or inert gas. Areas surrounding the work should be carefully wet down and tested with combustible gas alarm devices. At least one employee, whose duty consists solely of fire prevention, should be looking for trouble and should be extinguishing stray sparks. Adequate fire extinguishers should be immediately available.

Such maintenance features as disposal of oily waste should re-



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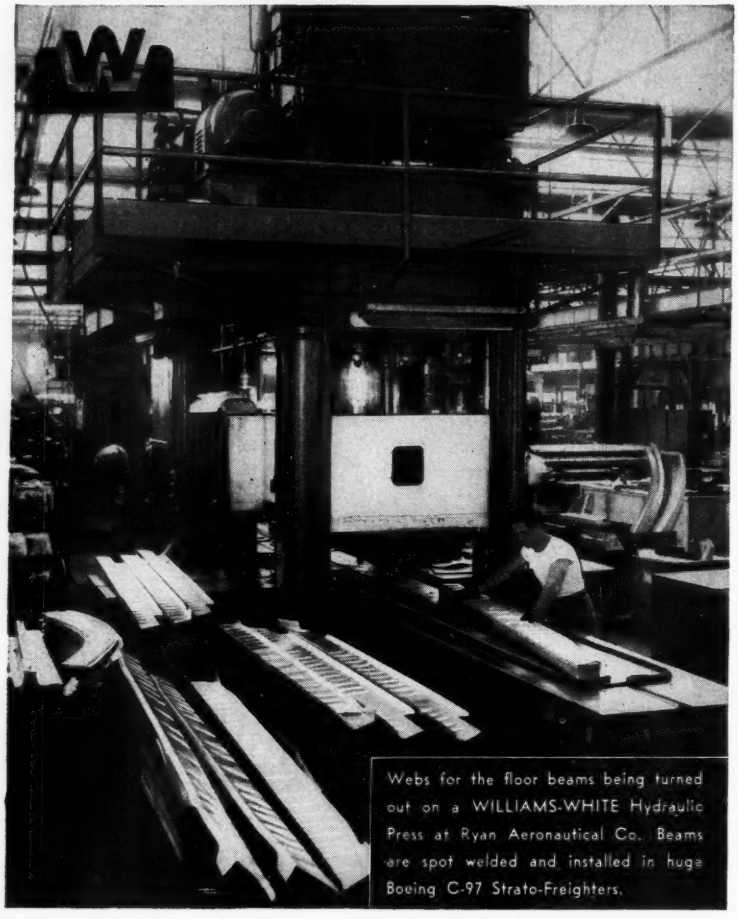
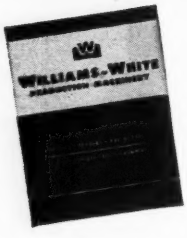
Wings for an Air Freighter . . . . on a WILLIAMS-WHITE PRESS



Webs for the floor beams being turned out on a WILLIAMS-WHITE Hydraulic Press at Ryan Aeronautical Co. Beams are spot welded and installed in huge Boeing C-97 Strato-Freighters.



Whatever size job you may have . . . for defense or commercial production . . . . there is a WILLIAMS-WHITE machine to meet your needs. Every WILLIAMS-WHITE machine is a custom built job, tailored to your individual needs. All over America they are meeting the demand for production.

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ceive careful attention. All metal waste receptacles should be located outside of the buildings. Another important maintenance feature for all manufacturing plants is the elimination of high grass and weeds in the plant yard which are a potential hazard when dry. Spraying the plant yard with some otherwise worthless residue is recommended.

Fire Extinguishers—Many types of hand fire extinguishing apparatus are effective.

1. In the coal and coke handling portions of the plant, carbon dioxide is used for the motors. If extinguishing equipment is desired for coal and coke fires, a 50-gallon water cask equipped with three pails and treated with calcium chloride, to prevent freezing, is probably as effective as any fire extinguisher.
2. In the by-products plant, it has been demonstrated that certain dry powder extinguishers are extremely effective in the extinguishment of gas fires. Under ordinary circumstances, it is probably better not to extinguish gas fires but to shut off the gas.
3. In the light oil and tar plants, foam type extinguishers are probably the most efficient, although carbon dioxide extinguishers are highly regarded. These latter have the disadvantage of not cooling the burned area and also the CO_2 gas is frequently easily dissipated. Carbon tetrachloride extinguishers are effective on electrical and oil fires but their use is dangerous in enclosed or poorly ventilated areas due to the suffocating quality of the vapor and the possibility of the generation of toxic gases. Work is now proceeding on a methyl bromide type of extinguisher which will probably be effective.

Employees should be carefully trained in the operation of fire extinguishers. Fire extinguishers should not be used in a situation in which the user of the extinguisher is in danger. The best procedure to follow in the event of fire or explosion is to sound an alarm which requires all employees to exit. Then, upon appraisal of the situation, steps can be taken to fight the fire. This necessitates the location of the fire extinguishers at doorways. All fire extinguishers require periodic inspections. A schedule providing for this should be set up and rigidly followed.

Fire Hydrants—These should be available for all portions of the plant so that no more than 200

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for maximum yield per ton!

There is no substitute for specialized experience. The strip steel products we produce are made on equipment designed to meet the quality standards associated with cold rolled strip steel — no substitute product produced by converting cold rolled sheet coils into strip widths can equal CMP's standards for close gauge tolerances and superior finishes. Where our competitors are strip sizes slit from sheet coils, we can point to our record without qualification. Just the ticket you would campaign for when less down time, longer die life, and more finished parts per ton is your desire. We believe we will merit your continuing support when you are called upon to ballot for better cold rolled strip steel products.

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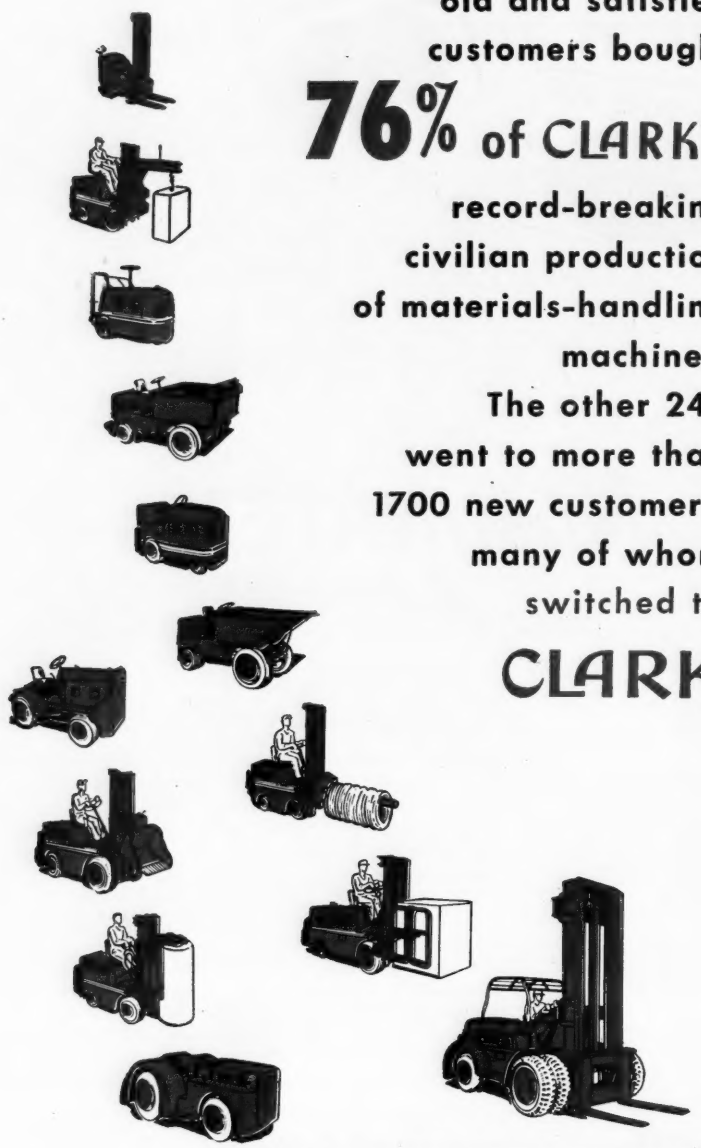

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feet of hose need ever be used and every hydrant should be equipped with the necessary 200 feet of hose, wrenches, axes, nozzles, etc. It is a good idea to have two kinds of nozzles in each house, the normal type and a fog nozzle. The fire hydrants should be supplied by a looped main of adequate size. Good practice in fire protection, however, calls for an elevated gravity tank of ample capacity. Such a tank will be effective only, however, if the fire protection piping system is separate from the water mains supplying the needs of the plant. It may be possible in many existing installations to provide check valves against the portions of the water system where large quantities of water are used.

High-Speed Wind

A TRANSONIC wind tunnel at the Navy's David Taylor model basin will permit testing of models at speeds up to 900 mph.

Completion of the tunnel is scheduled for late 1953. Based on a design partly built by the Germans near Munich, the tunnel will be closed circuit type, 574 feet long.

A 19-foot double fan with contra-rotating blades pushes the air. The fan was designed and built by German engineers and sized by the Allies in 1945.

A well-trained fire brigade for every shift is a must. It is desirable to hold drills weekly. Definite assignments should be given to the various members of the brigade. There ought to be a fire alarm system which will sound a coded signal to indicate the spot at which trouble has occurred.

Automatic Sprinklers — Extensive statistics gathered by various fire protection authorities clearly indicate that the automatic sprinkler system is a major factor in putting out fires. Where a violent explosion occurs, sprinklers probably will not do any good and the piping system may be wrecked. In many cases, however, sprinklers have prevented explosions by extinguishing fires which might have caused explosions and by operating following small primary explosions which might have resulted in de-

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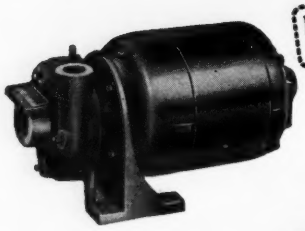
IMMEDIATE SHIPMENT

...OF I-R MOTORPUMPS

IMMEDIATE SHIPMENT



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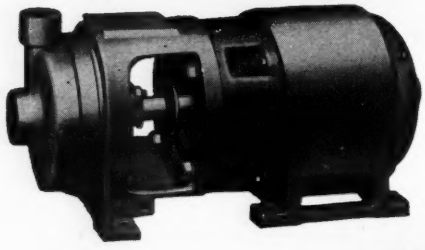

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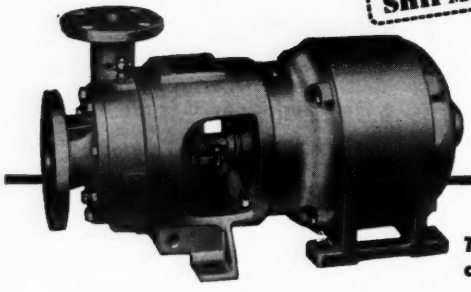

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vastating secondary explosions.

Where coal and coke handling buildings are of combustible construction or of metal sheathing on wooden frame, sprinklers should certainly be considered.

In by-product buildings where the roof is combustible, there is ample justification for an automatic sprinkler system. Such a system may save a building in the event of a gas fire.

The by-products building, and those of the light oil or benzol plant should be equipped with sprinklers where the roofs are combustible. Recently an installation of a water fog automatic sprinkler system has been made in a benzol plant of noncombustible construction. This system consists of spray nozzles located about 5 feet above the floor on columns, there being sufficient sprinklers to cover the entire floor. The idea is that if a still or tank ruptures and the contents burn on the floor, the system will be automatically operated by thermostatic devices but the system may not put out the fire. The fine mist from the nozzles should cool the burning gases, also inert water vapor formed would have a smothering action. Even though the fire is not extinguished, the system will probably save the structure, the supports for the equipment and much of the equipment itself.

Drainage Is Essential—Since the fire may not be extinguished, the problem of drainage is important. A large drain should run to a safe location though this favorable condition might not always be possible to obtain. In some cases it would probably be necessary to construct a drainage pit or diked area. If the liquid before being discharged into the pit passes through a water seal, this might extinguish any fire in the oil being discharged. Since the oil might be re-ignited in the pit, a safe decanting arrangement should provide that oil cannot be discharged through the siphon.

Recently automatic sprinklers using foam have been installed in a turpentine plant which uses benzol for extraction purposes, with distillation processes to separate the benzol from the turpentine. The hazard in this plant is similar to that in a benzol plant. The

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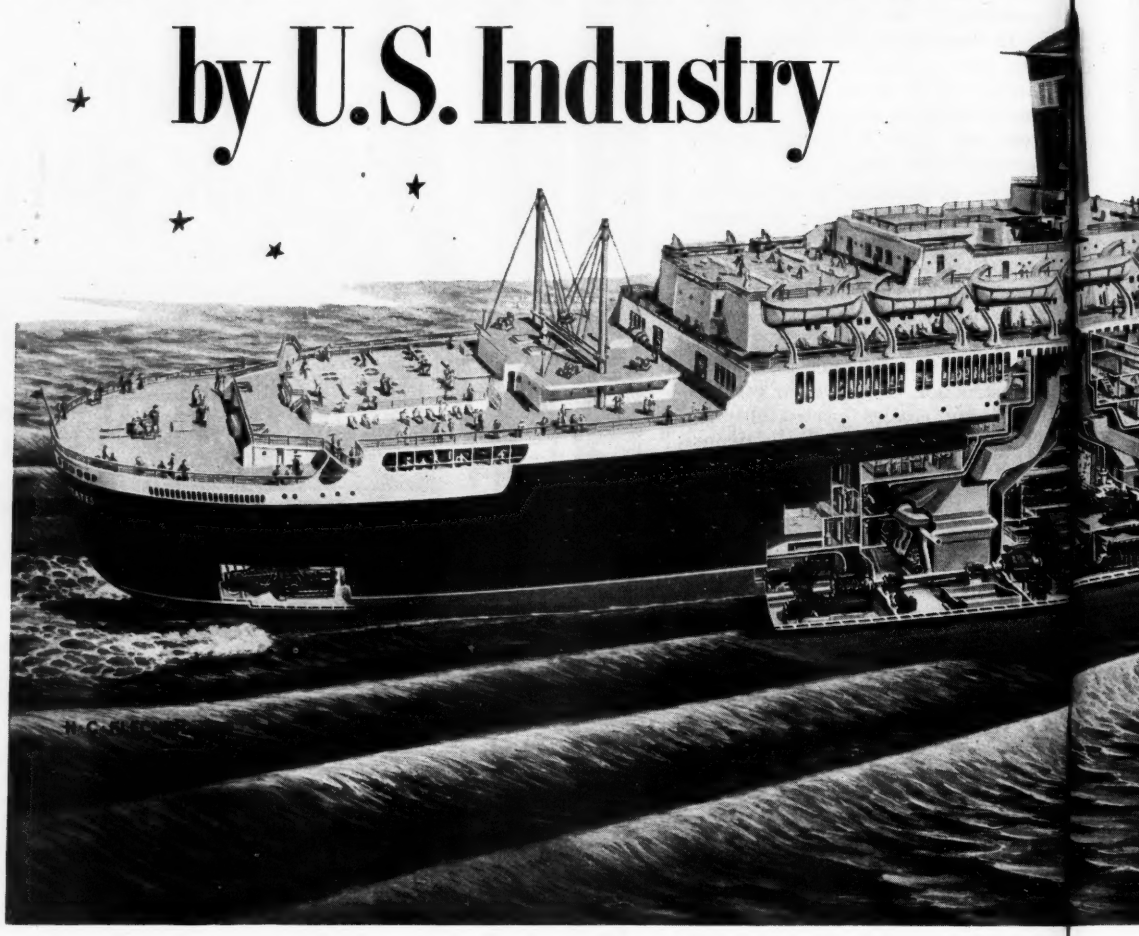

S.S. United States, New Flagship of American Merchant Marine, Protected by World's Greatest Lubrication Knowledge!

SAILING on her maiden voyage this summer, the 990-ft. S.S. *United States*, largest and fastest liner ever built in America, represents a cross section of U. S. industry . . . a composite of industrial lubrication problems.

Every state contributed to her construction, more than 800 firms supplied materials. Represented are the steel and aluminum industries, metal working, power generation, air conditioning, refrigeration, chemical, textile, plastics, electrical—many others.

Lubrication a Big Problem

The cutaway view shows a small portion of the machinery that powers and operates this world's

Designed by Gibbs & Cox, Inc. Built by Newport News Shipbuilding and Dry Dock Company.

most modern ship. It also indicates why the S.S. *United States* — containing many of the same machines found in plants, mills and mines — presented lubrication problems as complex as any ever encountered in industry.

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Other Murray products include stainless and carbon steel pipe, seamless mechanical tubing, pipe fittings, boiler tools and accessories. Write for current Tube Stock Bulletin.

Portable Power

Power and light available to this repairman are furnished by a portable branch circuit extension—a development of National Electric Products Corp., Pittsburgh. The firm's Rolladuct extension is approved for 20-amp loads at 115 v, can also use infrared heating or flood lighting units

sprinkler heads which are designed to discharge foam solutions are located on columns and are about 1 foot above the floor. Unlike the water spray system, it is believed that this system will completely extinguish fires.

Tank Protection — Vessels used for the storage of light oil and benzol should also be equipped with permanently installed foam connections of an approved design. Portable foam generators can be used in connection with a hose line from a fire hydrant. In addition, tanks used for the storage of light oils should be equipped with approved flame arrestors. These are especially designed venting mechanisms which permit breathing of the tank but because of an arrangement of screens will prevent flames from passing the screen. In the case of benzol tanks, there is a possibility that such a vent pipe will freeze up in cold weather unless heated with steam.

Most approved flame arrestors have moving parts which may possibly be rendered inoperative by residues forming in the vents, and for this reason they have not been looked upon with too much favor by coke plant operators. A series of exhaustive tests of flame ar-

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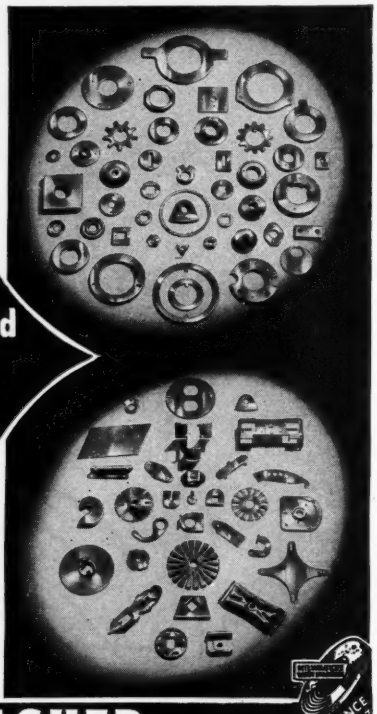

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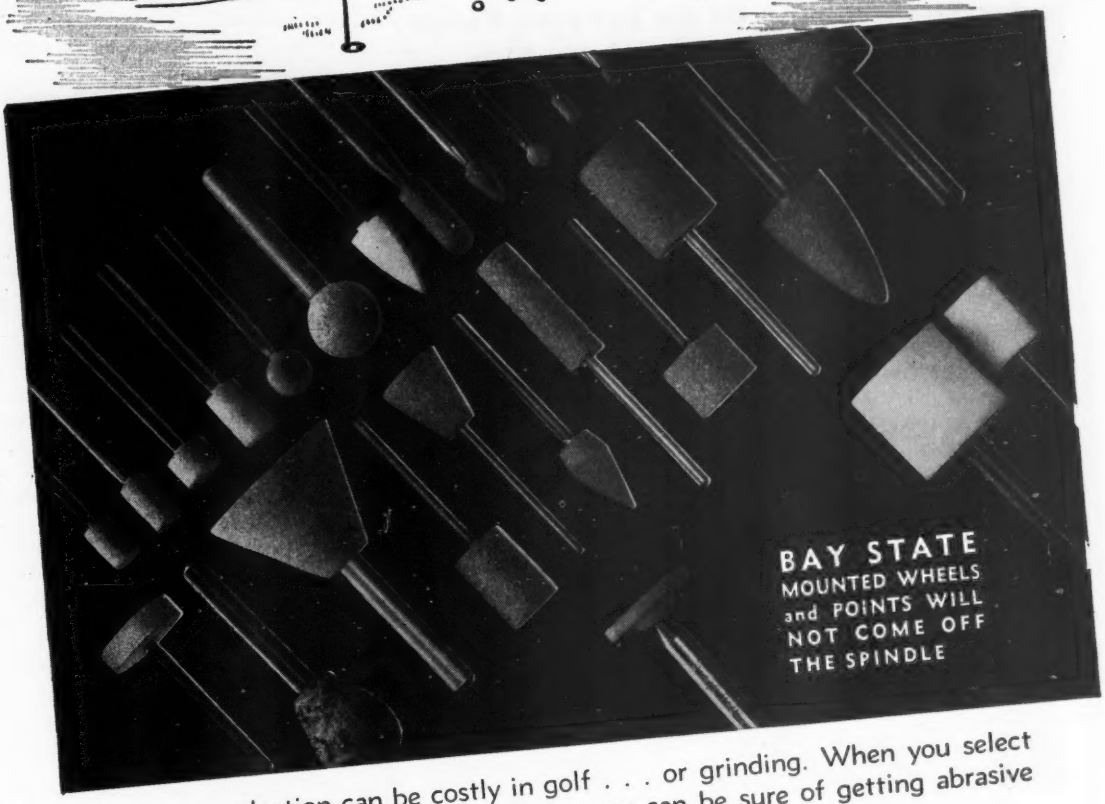

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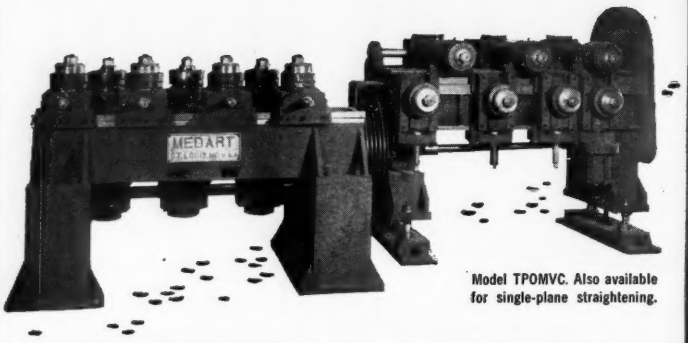

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restors under a variety of conditions in coal tar plants has been made and it is hoped that definite standards can be set up for flame arrestors which can be installed on all existing light oil tanks and thereby afford those tanks proper protection. It is most desirable to enclose all tanks containing combustible liquids with dikes of earth or masonry having a capacity equal to that of the tanks within the area of the dike.

Other Protection—Foam protection should be provided for sump pits and pipe trenches in the benzol plants. It would be better to eliminate pipe trenches by installing all piping above ground. A pipe trench, which is covered with an iron grill and arranged to be self-ventilating and self-draining, is not in need of special protection.

Several buildings usually are found at coke plants for which automatic sprinkler protection may be desirable, such as the storage building in which spare parts are kept. A serious fire in such a building is just as likely to interrupt production as if it had occurred in a manufacturing building. Laboratory buildings, especially where they control processes, also should be considered for the installation of sprinklers.

Where it is necessary to store coal for long periods of time, a primary problem is the prevention of oxidation and spontaneous combustion in the stock pile. This trouble can be minimized by careful stocking in layers of about 3 feet and rolling out the air with a roller or bulldozer. This is now being done in a number of plants not only as a fire prevention measure but also as a means of improving the uniformity of the coal going to the ovens.

From a paper presented before the American Coke & Coal Chemicals Institute, Chicago.

Softener Work Cuts Blanketing

Process equipment for softening and dealkalizing water and increasing capacity of anion exchange resins by 50 per cent is announced by American Water Softener Co., Philadelphia.

Resins function to absorb objectionable sulphates, carbonates and other anions from water. However, resin exchange capacity was found to be extremely low when

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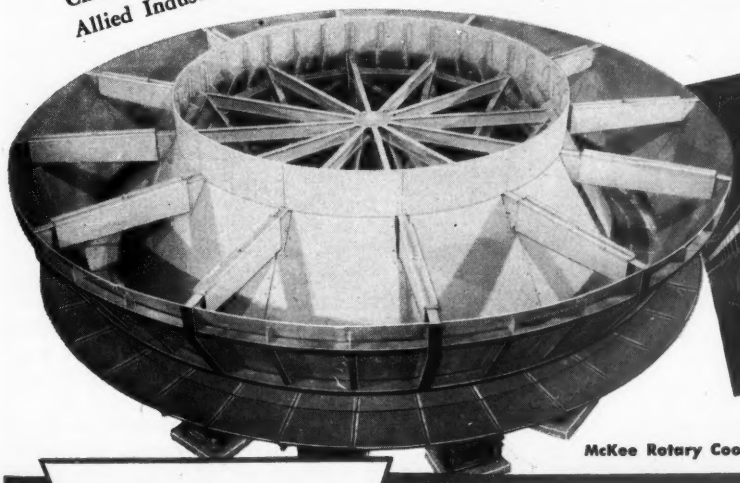
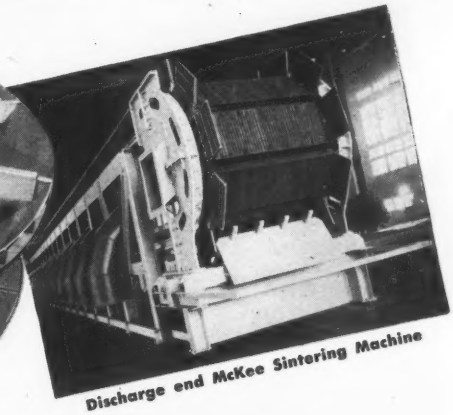
TO construct its newly developed sintering plant equipment, Cleveland's Arthur G. McKee Company chose The William B. Pollock Company, steel plate construction experts since 1863.

This latest sintering machine and rotary cooler were assembled in Pollock's Youngstown, Ohio plant and inspected by the customer and many interested iron and steel operators and engineers while in test operation. Then it was thoroughly match-marked, disassembled, and loaded on 16 railroad cars in such a way as to insure quick and efficient field erection.

Pollock is known the world over for its reliable, efficient heavy plate construction.



McKee Rotary Cooler 48 Ft. 4 In. Diameter



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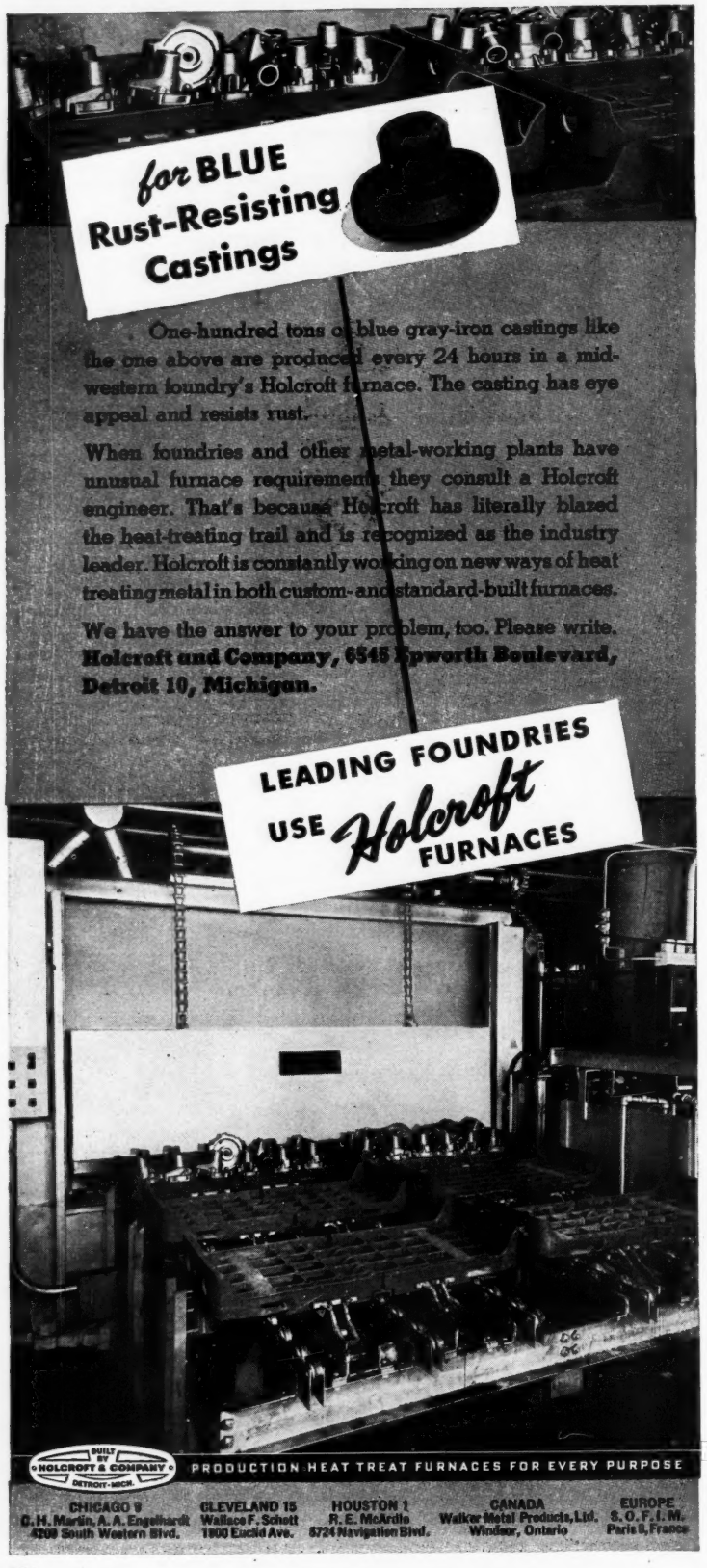
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only common salt was used as the regenerant. This was due to formation of blanketing gases that prevented complete regeneration of the resin bed.

By raising the hydrogen ion radical of the regenerative solution, company reports, its engineers solved the problem. Tendency toward resin blanketing was eliminated. They add that the process also improves effluent quality.

ISO Agrees on Steel Tests

Six methods for checking steel and steel castings approved by 13-nation committee

AGREEMENT on six methods of testing steel and steel castings was reached by a 13-nation technical committee meeting at Columbia University, the International Organization for Standardization announced June 13.

Twenty-three delegates from the national standards bodies of Belgium, Denmark, Finland, France, India, Italy, New Zealand, Norway, Spain, Switzerland, the United Kingdom, U. S. and Yugoslavia held four day-long meetings in working out the agreements.

The British Standards Institution holds the secretariat of the steel project for the United Kingdom, with H. A. R. Binney, its director, serving as chairman of the sessions.

The Tests—The test methods agreed on by the committee are the Rockwell, Brinell and Vickers tests for hardness, the bend test, and the Izod and Charpy impact tests.

The tolerances on the various dimensions given in the tests were not included in the work of the committee at this time. These tolerances, together with questions of the calibration and accuracy of testing machines, will form a high priority item for working groups which the committee set up.

One working group will re-formulate draft proposals on tensile strength testing which were drawn up at a committee meeting held in London in the autumn of 1950, to bring them in line with decisions reached this week. A second group will prepare proposals for tests on sheet metal and strip. A third will prepare test proposals for wire.

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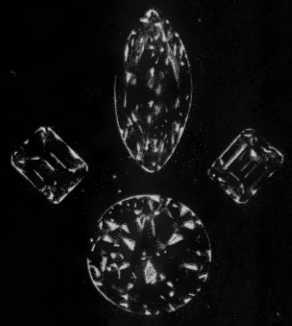
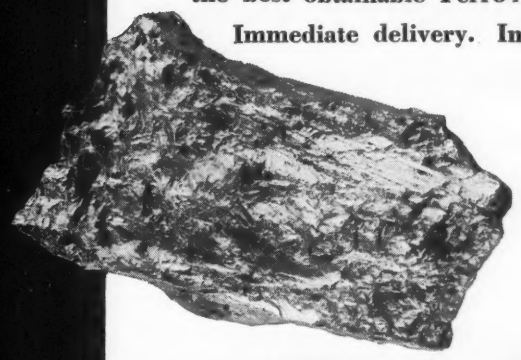


Courtesy of DeBeers Consolidated Mines, Ltd.



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Standards from Wars

BOTH RECENT World Wars stimulated the development and use of standards for materials. In 1917 there were 133 standards registered by the American Society for Testing Materials.

In December 1940, the year before Pearl Harbor, 952 standards and tests were available for use by industry and the government.

Now there are about 1850 standards, so that in the last decade or so, there were as many standards made available as in the 22 years between World War I and II.

This growth has resulted in a greatly expanded book of ASTM standards. The 1952 edition will aggregate some 10,000 pages in seven parts.

agreements reached are revised to include tolerances, they will be submitted to bodies of participating nations for ratification.

The committee is expected to meet again in full session sometime within the next two years after the working groups have done their jobs.

Cyril E. Phillips, member of the British government's Department of Scientific Research, headed the British delegation.

The American delegation included: Edmund V. Bennett, assistant metallurgical engineer, Bethlehem Steel Corp., Bethlehem, Pa.; R. D. France, metallurgist, Pitman-Dunn Laboratories, Frankfort Arsenal, Philadelphia; K. L. Fry, Bethlehem Steel Corp., Robert H. Heyer, supervising metallurgist, Armco Steel Corp., Middletown, O.; V. E. Lysaght, assistant to the president, Wilson Mechanical Instrument Co., New York; Warren H. Mayo, assistant manager, Metallurgical Department, U. S. Steel Co., Pittsburgh; K. M. McInerney, Corrigan and McKinney Division, Republic Steel Corp., Cleveland; and Sam Tour, chairman, Sam Tour & Co. Inc. consulting engineers, New York.

Progress Encouraging—Mr. Binney, chairman of the sessions, declared at the close of the meeting:

"We made better progress than we had hoped for when the meet-

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FIRST IN FIRE PROTECTION

ing began. We went over the draft proposals on these six tests one word at a time. The discussions were frank and free, but there is not one outstanding point on the tests where agreement was not reached. And that agreement covers the vast majority of mechanical tests of the principal engineering material."

This was the third meeting of the committee since the war, but the first meeting where a fully representative American team was present.

The U. S. is listed as an observer nation in the work of the technical committee on steel.

Long Range Program — One member of the committee spoke of the standardization work accomplished thus far as early steps in an important program that will take perhaps as long as 40 years to complete. Future unscheduled work, he said, might begin with standardization of nomenclature and then go on to formulation of agreement on steel products themselves.

ISO technical committee 17, steel, is one of 15 committees and subcommittees which met during the two-week ISO triennial session, June 9-21. A total of 76 committees are working on ISO standardization projects.

A total of 185 delegates from 24 foreign countries, and about 250 American delegates, attended the sessions at Columbia.

Odorless, Nontoxic Agent

Nonstaining, transparent compound is calculated to cut down operator resistance

SULPHUR-FREE cutting agent X-30, employing as its catalyst an organic compound said to be nonstaining and completely transparent, is introduced by Metalloid Corp., Huntington, Ind. Odorless and nontoxic, the agent is calculated to cut down operator resistance.

It uses any regular paraffin or naphthenic cutting oil as its vehicle and can be applied in ratios as high as 4 to 1. Function of X-30 is based on the principle of limiting and localizing energy absorption in the workpiece by increasing internal lattice energy at the rupture area.

Reaction at the Rupture Area—In practice, the company says its heat-limiting dynatomics concept requires higher surface feet per minute with slightly reduced feed. This reduces movement to only those atoms immediately adjacent to the separation area. In this way, Btu's per cubic inch are reduced.

By giving up free atoms through heat generated by plastic deformation, the agent causes a reaction with the metal at the rupture area. Result is similar to the brittlizing effect of nitriding or carburizing. Free atoms disassociated from the agent unite with those located in the active metal lattice.

Short, Brittle Lengths — The company cites machining of ductile steels to illustrate the dynatomics phenomenon. In these cases, they say the chips are broken into short, brittle lengths instead of coming off in long ribbon formations.

Because X-30 contains no sulphur and will not stain, applications are indicated in the manufacture of silver bearings and other alloys. Here, according to the manufacturer, processed cutting agents were not permissible before.

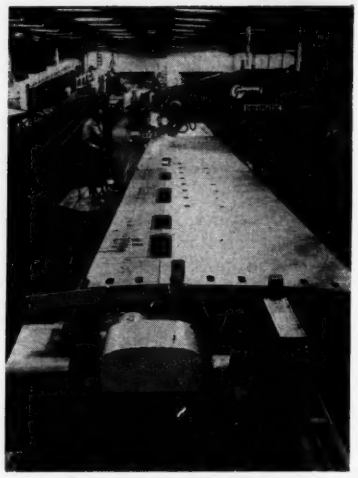
Positioning by Pushbutton

Temco says lateral shifting cuts 4 to 8 hours riveting time from each wing panel

AIRCRAFT RIVETING, already a high speed operation, is pushed even faster at Temco Aircraft Corp., Dallas, by installation of a new pushbutton controlled lateral shifting setup. Development of the installation, for work on contoured skin panels, is described by the firm's president, Robert McCulloch.

Mr. McCulloch says the setup is saving 4 to 8 hours on each P2V-5 wing panel the company is manufacturing for Lockheed Aircraft Corp. It permits approximately 1000 more rivets per panel to be pressed than was possible previously.

Greater Accuracy—Other advantages resulting from the new installation, according to Mr. McCulloch, are far greater accuracy than was previously possible, and a reduction in operator fatigue.



LATERAL SHIFTING
. . . wing panels riveted faster

Lateral shifting mechanism, Mr. McCulloch reports, was developed to increase output obtainable with Lockheed designed tables furnished to Temco when it contracted to manufacture P2V outer wings.

Tables had provisions made for remote-control longitudinal shifting along a given row of rivets, but they left all lateral shifting as a manual operation.

No More Cranking—As a result, at the completion of each line of rivets, the operator had to go first to one end of the table, then to the other loosening clamps, shifting the panel with a bell crank, then retightening the clamps he had loosened. Operator can now position the panel anywhere along either axis without leaving his chair.

Temco's installation is mounted directly on the Lockheed table. It involves only minor modification of the table itself. Principal changes are in the carriage where motors and solenoid clamps replace hand cranks and mechanical clamps. The only major addition is a 66-foot length of trolley track mounted on a guard rail parallel to the rear of the table. This track carries a ten conductor 600-v tested No. 16 control cable mounted on roller type carriers.

Five Elements—There are five basic elements in the installation. These include the lateral shifting

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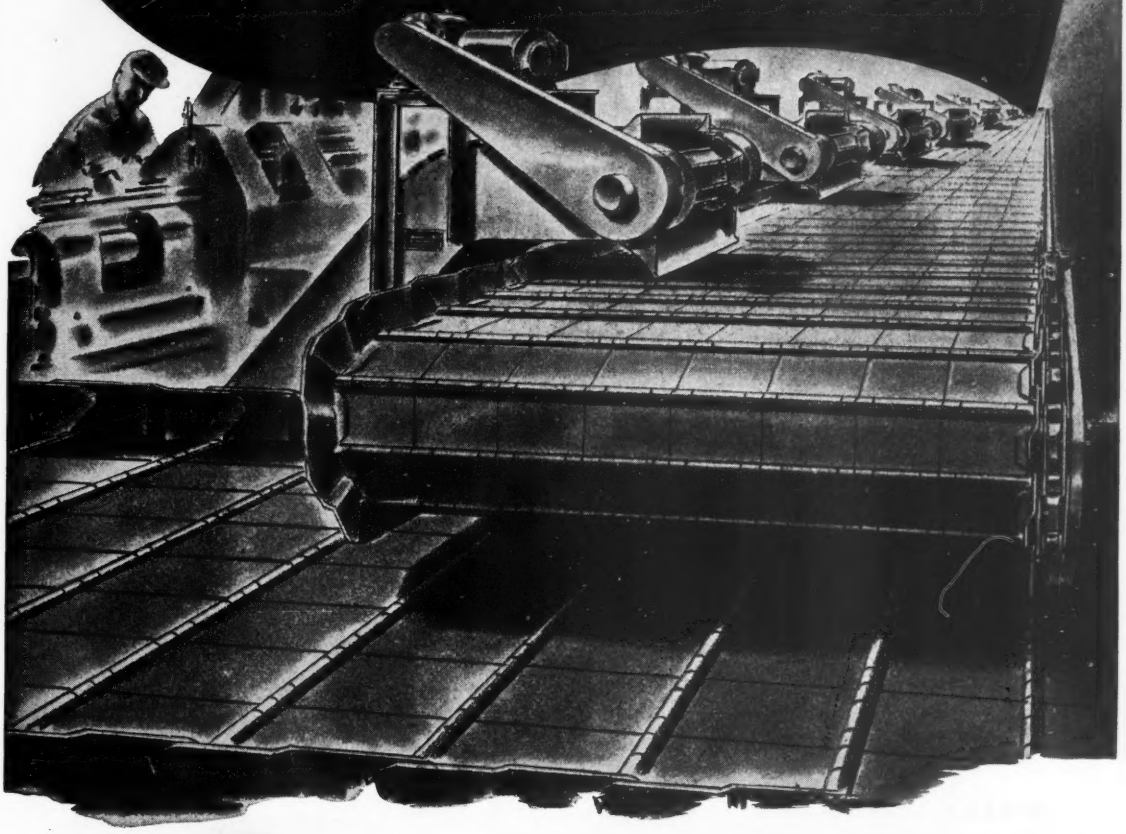

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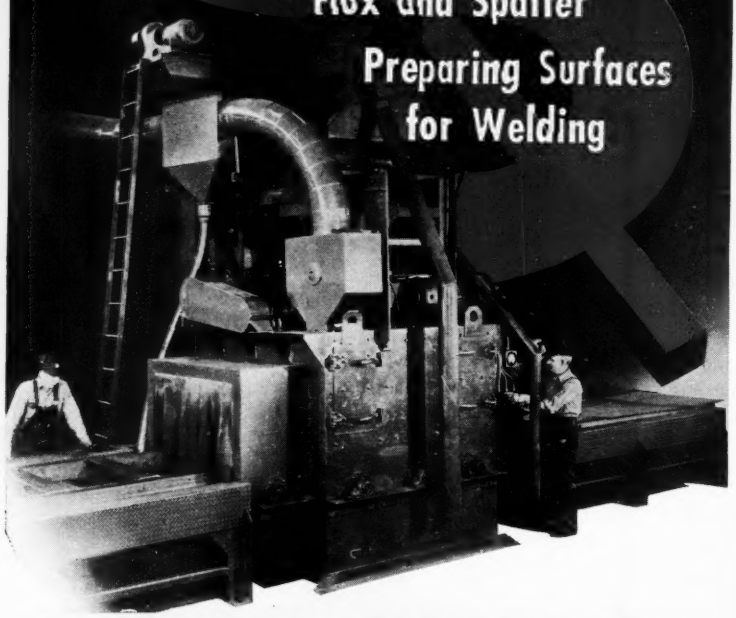

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mechanism that replaces the hand crank. Tension mechanism releases tension on the contour bars to which the panels are bolted prior to shifting and restores tension after the shift is completed. Solenoid clamp maintains tension on the indexing bar except during lateral shifts.

The last of the five, or the actual control mechanism, and a group of electrical and mechanical safety provisions, make it almost impossible to damage table, carriage or panel through operator error.

Welds Keep Cars Rolling

Fluted side members of railroad passenger cars are repaired without replacing entire panel

STRAIGHT-BUTT welds in 18-8 stainless steel, 0.019-inch thick are a routine job in the repair shops of Pullman Co., Chicago. This work is being done by using Heliarc welding on stainless steel fluted

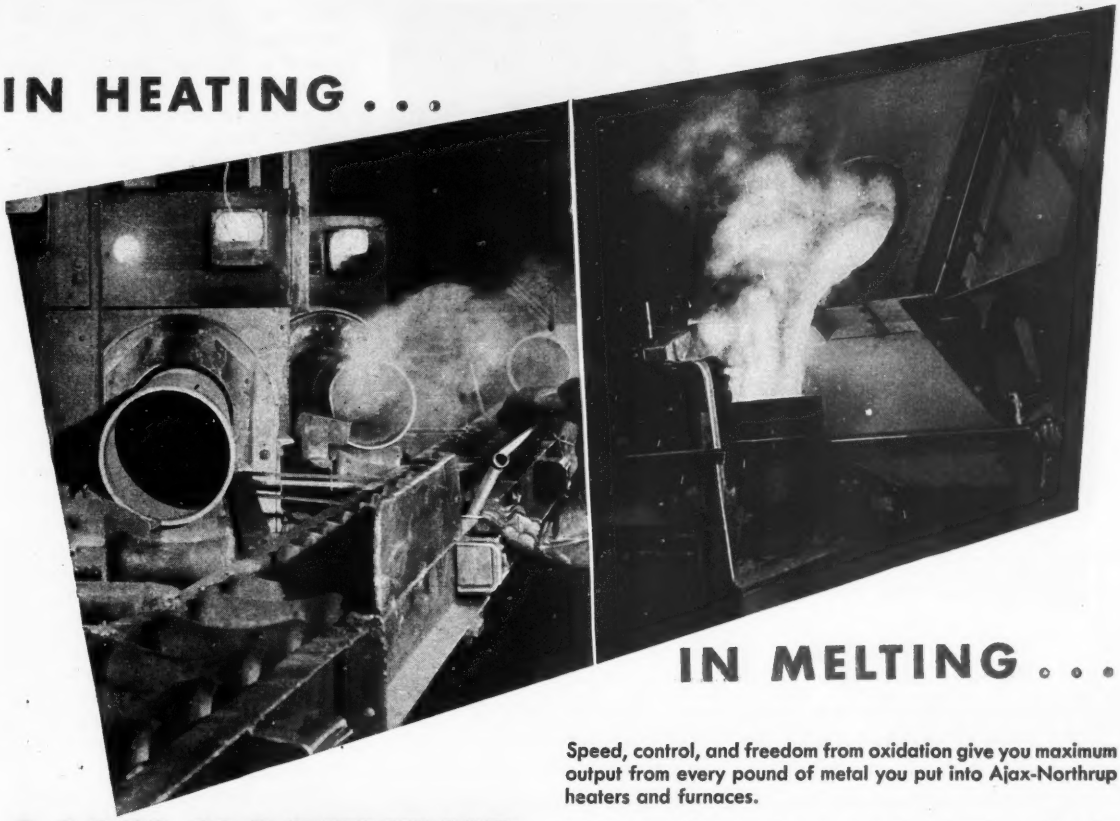
WELDING STREAMLINERS
. . . 11-amp current does it

side members of passenger cars which are frequently damaged.

Damaged stainless strips are loosened from the car side in order to weld on a new section. Damaged ends are cut off square and a new section is tightly butted and held in place by a hinged copper backup and hold down fixture that conforms to the shape of the fluting.

No Spatter—The welding process produces a minimum build-up

IN HEATING . . .



IN MELTING . . .

AJAX-NORTHRUP *Saves Metals*

Speed, control, and freedom from oxidation give you maximum output from every pound of metal you put into Ajax-Northrup heaters and furnaces.

Induction melting furnaces melt so fast there's no time for oxidation—losses of critical elements are held to a minimum. One user, melting stainless steel, reports recovery of 100% of the nickel charged, 99.0% of the chromium, 90% manganese, and 92% columbium. Another saved $60,000 a year just by reducing chromium losses!

Forging heaters are equally thrifty. One automobile manufacturer reports ten tons of steel saved a day—enough for 3800 additional forgings. Savings up to 20% are commonplace, because fast, automatically timed induction heat eliminates steel-wasting scale and permits the use of smaller billets.

Ajax-Northrup melting furnaces are available in sizes from eight ounces to 8 tons, to melt *any* metal. Heaters for forging and other uses can be engineered to suit practically any of your high-speed production line jobs. Put our 35 years of experience with induction to work for you—write us today!

SEND FOR NEW INDUCTION HEATING AND MELTING BULLETIN.

AJAX ELECTROTHERMIC CORPORATION

AJAX PARK • TRENTON 5, NEW JERSEY

AJAX NORTHRUP

HEATING AND MELTING

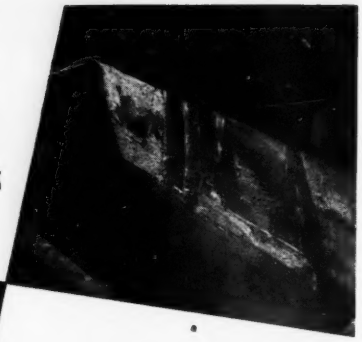
Associate Companies

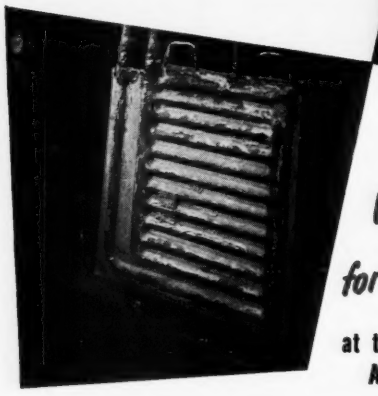
AJAX ELECTRO METALLURGICAL CORP. • AJAX ELECTRIC COMPANY, INC.
AJAX ELECTRIC FURNACE CORPORATION • AJAX ENGINEERING CORPORATION

135

PLATECOILS
(REPLACE PIPE COILS)

heat this parkerizing tank





WITHOUT DOWNTIME
for CLEANING or REPAIRS

at the Lycoming Spencer Division
Avco Corp., Williamsport, Pa.

The only time this Platecoil was removed in over a year at Lycoming Spencer was to take its picture. The single 22" x 23" Platecoil has heated a 100-gallon Parkerizing tank, in daily use, *without downtime.* Built of Electro-polished Stainless Steel, the Platecoil has required *no cleaning or repairs.* Any deposit that builds up on the coil during the course of operation is "shocked off" when the steam pressure is dropped in the coil.

Notice how easy it is to lift the Platecoil out of the tank when the time comes that it does have to be cleaned, repaired or replaced. There are just two connections to loosen and both are outside the solution. The Platecoil merely is lifted out of the tank and replaced with little or no delay in production.

Platecoils have other advantages, too. They have about twice the heating area for a given space than can be obtained with pipe coils. Thus smaller size Platecoils can be used to save initial cost, tank space and handling time.

Learn how you can cut your heat transfer costs by sending today for Platecoil bulletin No. 72.

PLATECOIL gives you these ADVANTAGES

- Cleaned and Repaired Without Dumping Tank Solution
- Greater BTU Transfer Per Unit Area
- Weighs Only Half as Much as Pipe Coil
- No Threaded Joints in Tank
- Increased Tank Capacity
- Fast, Easy Installation
- Easy to Clean

PLATECOIL
Division
KOLD-HOLD MFG. CO.
LANSING 4, MICHIGAN

with no spatter. A quick light grinding followed by buffing produces a finished joint in which it is practically impossible to detect the presence of a weld.

Prior to the welding of this thin fluted material it was necessary to replace a strip for the entire length of the car side. This in itself was wasteful and to ship these required two flat cars.

Machines Work Jet Bearings

Two special machines built by Buhr Machine Tool Co., Ann Arbor, Mich., solved the problem of drilling and tapping 24 blind holes on the inside of a jet engine bearing support. All holes were unevenly spaced, at different levels and in a working area too small to use a conventional drilling unit.

The company picked a reciprocating-type drill head for the job. Drill head is mounted on a hydraulically-operated way-type slide and includes four drill spindles at each end. Because space for mounting an electric motor was insufficient, drills are driven by a hydraulic motor.

This method also eliminated need for a change-gear box. Proper tool speed can be selected easily by controlling speed of the hydraulic motor.

Equipment for each machine includes a special rotary table that features irregular spacing. Table is interlocked electrically in such a way that holes can be drilled only in proper relative positions. Tapper functions on the same principle as the drilling machine except taps are driven by a master lead screw.

Chemical Handling Reviewed

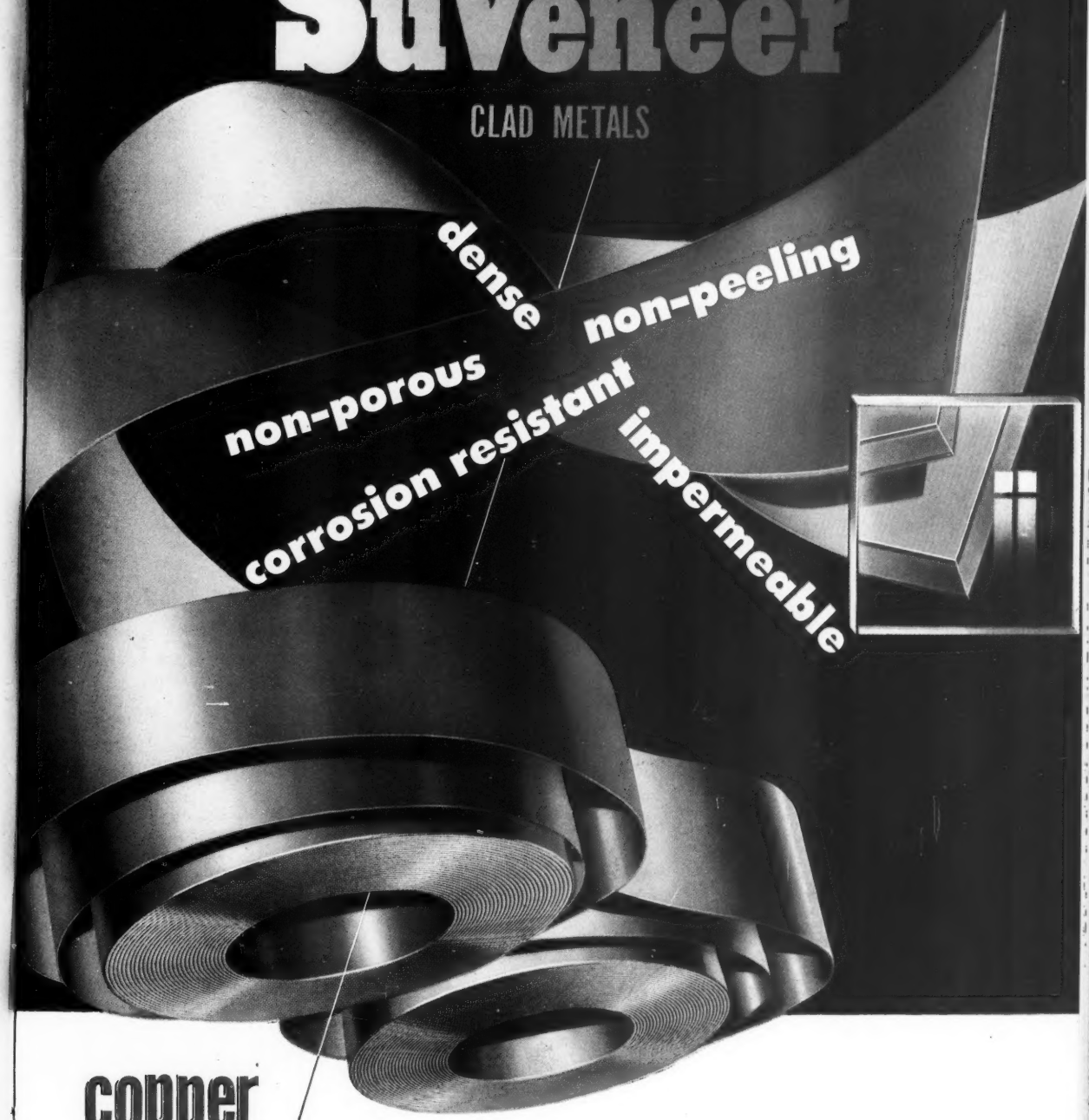
Safe handling and use of sodium and potassium dichromates and chromates is the subject of data sheet SD-46 published by Manufacturing Chemists' Association Inc., Washington.

Booklet points out that these chemicals may be transported and used with safety if properly handled. Possible health hazards involve irritation of mucous membranes, eyes and skin.

Recommendations are made regarding engineering controls, ventilation methods, tank cleaning and repairs and waste disposal.

SuVeneer®

CLAD METALS



copper or **brass** bonded inseparably to low carbon steel

Here is your answer to the need for conserving critical metals: **SuVeneer** Clad Metals save up to 80% of solid copper or brass, while giving you every surface advantage of these strategic materials in your products. Actual copper or brass face one or both sides of the steel strip, in constant thickness-ratio for all strip gauges. Fabricate **SuVeneer** Clad Metal any way you like—the bond is mechanically inseparable—the production behavior is excellent! *We'll gladly advise you on your applications, without obligation.*

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

a matter of confidence

Specialists who designed this speed reducer entrusted production of its bronze worm gear blank to other specialists.

Foote Bros. Gear and Machine Corporation, Chicago, leading producers of Speed Reducers, Gears, and other quality Power Transmission Components for practically any industrial requirement, identify themselves with the phrase "BETTER POWER TRANSMISSION THROUGH BETTER GEARS."

For over twelve years, Foote Bros. have purchased thousands of ½ pound to 1500 pound non-ferrous gear blanks from National Bearing Division—confidently entrusting their reputation and industry leadership to special foundry skills for which National Bearing is famous.

And Foote Bros. confidence is well placed.

National Bearing's proven ability to mass produce exceptionally fine-grained, non-ferrous castings, free from blow holes and sand inclusions, can be depended upon under even the most exacting engineering and manufacturing specifications.

As a typical customer service-plus, National Bearing Division's engineers and foundrymen recently designed, and produced for customers like Foote Bros., a bronze gear blank that contains even higher physical properties.

Through a new foundry technique, National Bearing imparts greater hardness, finer grain, and more tensile strength to the bronze gear blank ring, to a depth below where the teeth are cut. In addition, this new process gives such extra advantages as higher uniformity, closer tolerances, and economy of stock.

If your product requires special mass-produced non-ferrous castings or bearings, National Bearing Division has the foundry facilities, experience, and skill that will insure better product performance, and may possibly lower product costs through production-run economies. You are invited to write to National Bearing Division for complete information.

AMERICAN **Brake Shoe** COMPANY

NATIONAL BEARING DIVISION

4925 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

CALENDAR OF MEETINGS

July 18-19, Truck-Trailer Manufacturers Association: Annual summer meeting, Edgewater Beach Hotel, Chicago. Association address: 1024 National Press Bldg., Washington 4. Managing director: John B. Hulse.

July 25, Malleable Founders Society: Western sectional meeting, Hotel Drake, Chicago. Society address: 1800 Union Commerce Bldg., Cleveland. Secretary: Lowell D. Ryan.

August 11-13, Society of Automotive Engineers: National West Coast meeting, Fairmont Hotel, San Francisco. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

August 19-22, American Institute of Electrical Engineers: Pacific general meeting, Phoenix, Ariz. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

Study Covers Lost Wax Casting

Latest methods used in the lost-wax or investment process for producing precision metal castings are presented in a report released by Office of Technical Services, Washington.

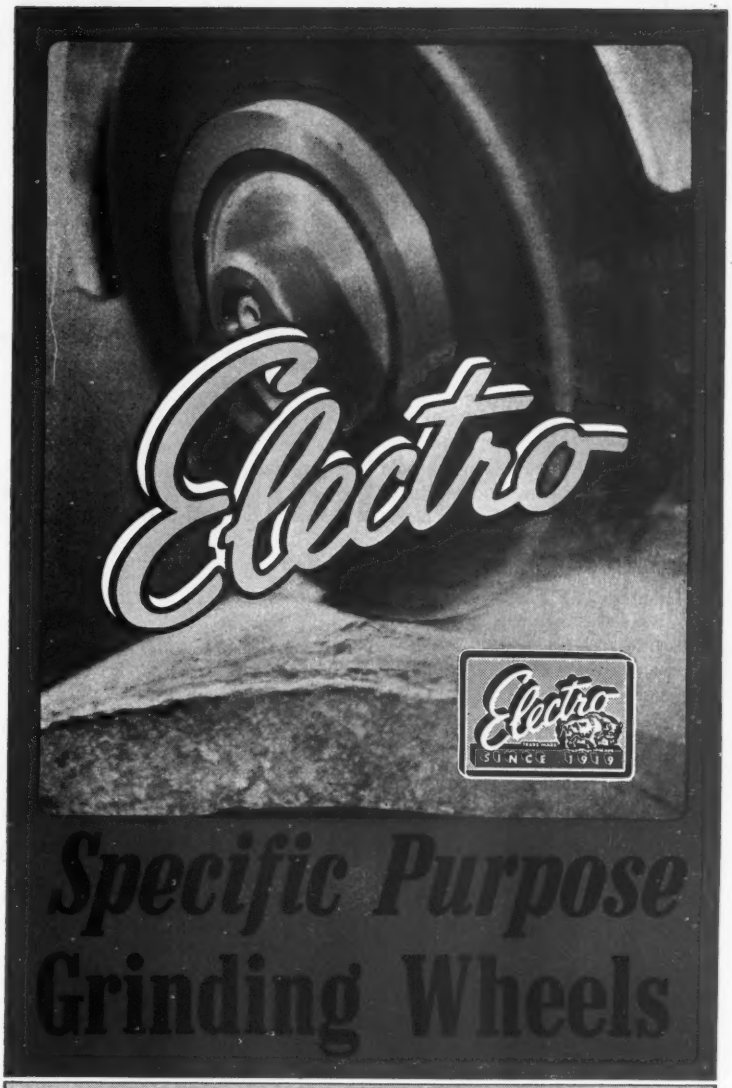
Investment casting process uses expendable wax pattern surrounded by silica refractory molds for casting metals close to finished dimensions. This antique process was revived and expanded in recent years to produce jet engine parts that can not be forged or machined readily. It is also used to save tooling time and expense in making small intricate parts of mechanisms in common steels and nonferrous metals.

This report discusses history, uses, process details, precision attainable and limitations of the process. Especially valuable is an extensive bibliography listing literature references, government reports, and books on this and related casting methods.

Brake Lining Process Reported

Method of manufacturing brake lining to produce uniform structure throughout, uniform coefficient of friction and uniform rate of wear has been patented by Russell Mfg. Co., Middletown, Conn.

The firm reports strands of asbestos web are saturated and surrounded completely with a special frictional binder material. This mass is compressed under 300 tons pressure, effecting a density of 120 pounds per cu ft. As a result of this density, the company adds, the lining will not absorb water.



Electro is *the* recognized dependable source of supply for *specific purpose* grinding wheels because our Sales Engineers determine the requirements; our Abrasive Engineers specify the bonding, the grain composition and the grain combination.

If the wheel you need isn't made, we'll make it for you. May we send a Sales Engineer to consult with you without obligation? — and a free copy of our Grinding Wheel Manual 645 together with a Speed Calculator?

Electro Refractories & Abrasives Corporation
344 Delaware Avenue, Buffalo 2, N. Y.
Regional Warehouse: Los Angeles 58, California
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You get *MORE* than just steel

Personalized service is the big "plus" you get when you come to us for your warehouse steel requirements.

Warehouse steel is a bargain for you when you take full advantage of the "no extra charge" service United States Steel Supply's team of technical and service experts will give you.

Full information on available steel supplies . . . current prices . . . latest in production techniques . . . machinery and shop supplies . . . will be brought to you *personally* by the United States Steel Supply salesman, who regards your needs as his personal responsibility.

Get more than just steel
by calling your source of *personalized steel service* . . .

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USS

UNITED STATES STEEL

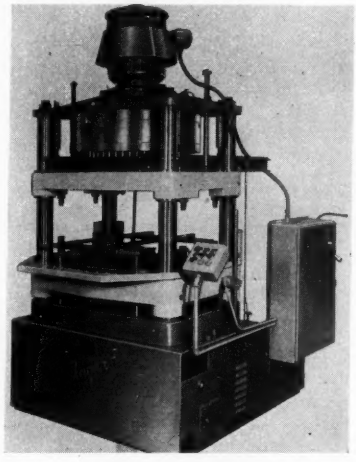
New Products and Equipment

Heavy Duty Drilling Machine

USE REPLY CARD—CIRCLE No. 1

Four standardized sizes of heavy duty drilling machines to drill a maximum 600 holes simultaneously are announced by Zagar Tool Inc., 24000 Lakeland Blvd., Cleveland 23, O. Machines are made to incorporate the company's drill heads, which are interchangeable. Changeover from one job to another is comparable to punch press setups and can be completed in a few hours. No electrical or plumbing connections are necessary.

Drill heads are driven directly by electric motors from 5 to 30 hp. Hydraulic ram in the machine's base feeds the work into drills and lowers to original position automatically after drilling is completed. Cycling, completely automatic or semiautomatic, is controlled hydraulically with electrical controls.

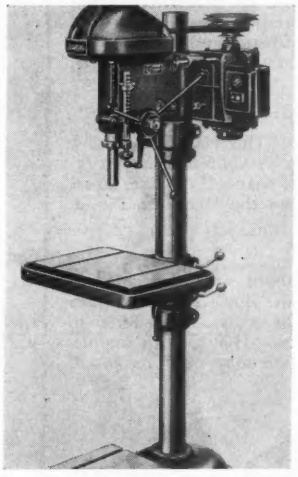


. . . four sizes are standardized

General Purpose Drill Press

USE REPLY CARD—CIRCLE No. 2

Massive construction to take full advantage of tool and job capacity is a feature of a Clausing 18-inch general purpose drill press announced by Atlas Press Co., 2023 N. Pitcher St., Kalamazoo, Mich. Applications for the press range through production, tool room, maintenance and service shop work. Its drive spindle is supported by two life-sealed ball bearings, one above and one below the pulley. Precision-ground spindle is floated free from the quill by another life-sealed ball bearing at top and a double-row bearing at bottom. Both races in the double-row bearing absorb thrust.



. . . jobs from production to tool shops

Vernier depth stop offers control accurate to 0.001-inch. Spindle travel reaches 6½ inches to provide ample work capacity and improved use of quick-release production chucks. Positioning mechanism moves both head and table.

Crane Has Hydraulic Boom

USE REPLY CARD—CIRCLE No. 3

Improved model Hydra-Lift crane with hydraulically-powered boom is announced by Pitman Mfg. Co., 300 W. 79th Terrace, Kansas City 5, Mo. Improved unit, called model B, requires 40 inches space behind truck's cab, has a loadline capacity of 6400 pounds and a swinging boom that telescopes from 12 to 17 to 22 feet.

Rated capacities are not increased. To raise the safety margin, point of the crane's mast where the topping cable is anchored has been raised about 18 inches. Effect is to widen the angle between the boom and topping cable. Other changes include addition of a bail bar on the topping cable and replacement of the hammerhead boom-tip casting with a swivel type unit. Lever controls replace the push-pull type. Also available are a special set of controls for operating the lift outside the cab.

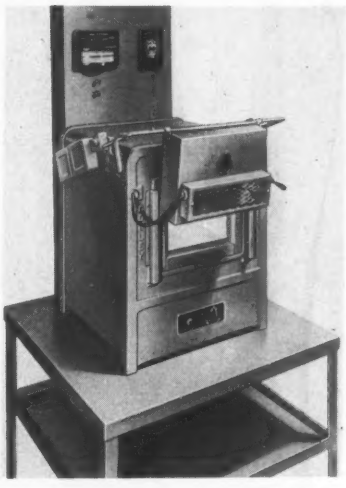
REPLY CARDS

on page 151 will bring you more information on any new products and equipment in this section.

Furnace, Oven Line Expanded

USE REPLY CARD—CIRCLE No. 4

Bench-type furnace, model VK 6, made for heat treating to 2000° F, is an addition to the line of furnaces and ovens made by Cooley Electric Mfg. Corp., 38 S. Shelby St., Indianapolis, Ind. Model has chamber dimensions of 10 x 6 x 18 inches. Heating elements are 6.5-kw capacity at 220-v, single phase located on all four sides of the chamber and in its door. Elements are designed by the company to protect wire against atmospheric attacks and mechanical breakage. They can be renewed without dismantling the furnace.



. . . bench type furnace heats to 2000°F

Included with the furnace is a

RELENTLESS PRODUCTION SCHEDULES

and

SMALL PRECISION GEARS

•

FEELING FUTILE?

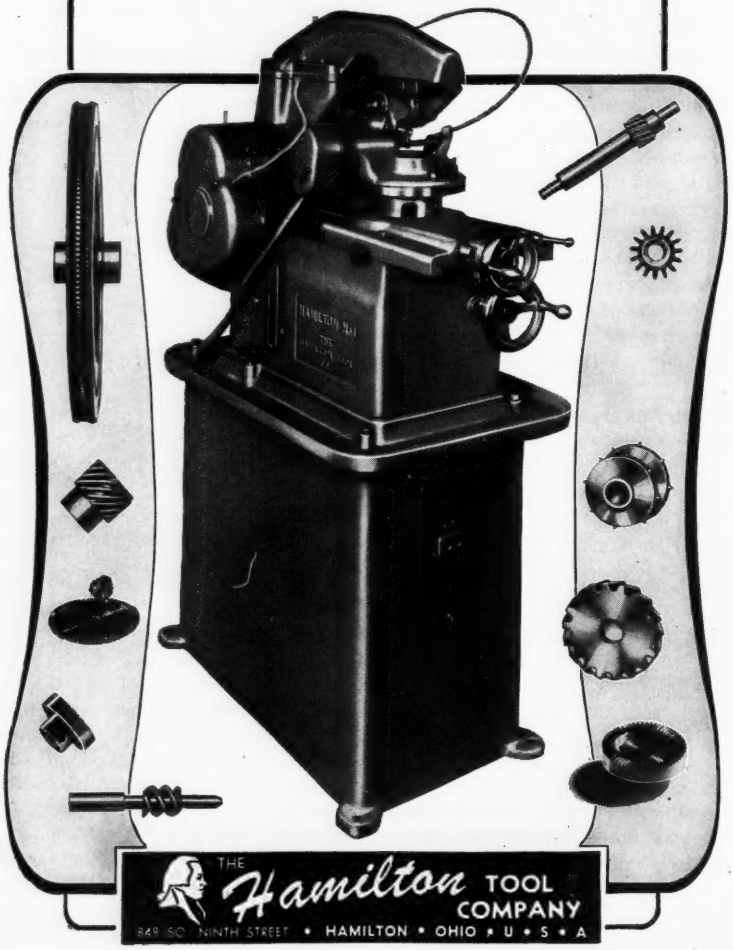
Unusual conditions are usual now. You are *expected* to build small, precision mechanisms on fast production schedules. And you will be expected to produce them better and faster tomorrow. But why worry? All you will need will be better machines.

MORALE BOOSTER

And better machines are here *now!* The Hamilton No. I Precision Small Gear Hobber will *solve* your problem in respect to gears. All gears, regardless of shape, if they are small and exact, can be produced faster on the Hamilton No. I.

FREE HELP

You don't expect full information about such a machine in the small space of one advertisement. But full information is available . . . ten printed pages of it . . . and offered to you free. Write for our Bulletin No. H-492, with supplement. Do it now . . . tomorrow you may need to *know!*



THE Hamilton TOOL COMPANY

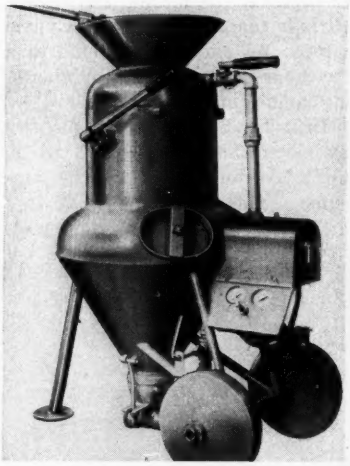
849 SO. NINTH STREET • HAMILTON • OHIO • U • S • A

fully wired and integrally-mounted control panel. This carries a controlling pyrometer, fused line switch and instrument fuses.

Unit Places Cement Materials

USE REPLY CARD—CIRCLE No. 5

Machine designed for air placement of all types of cementitious materials is a development of Blastcrete Equipment Co., 11154 Santa Monica Blvd., Los Angeles 25, Calif. Operator has complete control of air pressure and material



. . . operator controls air pressure, volume

volume and all adjustments can be regulated while machine is in operation.

Relatively small capacity air compressors can be employed because of an efficiently designed agitating and material metering mechanism. Maintenance costs are reduced by holding number of wearing parts to a minimum. The unit is available in three sizes and can be adjusted to deliver material from a few cubic feet per hour to four cubic yards per hour.

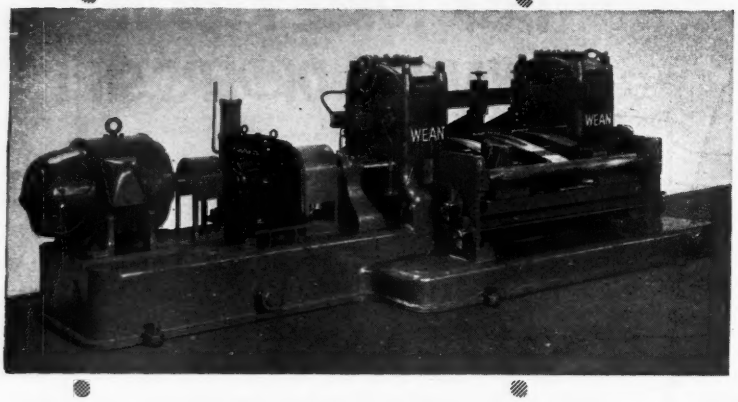
Machine Coils Wire Evenly

USE REPLY CARD—CIRCLE No. 6

Synchronized rolling action of all coiling parts is the operating principle of a wire-coiling machine developed by Driver-Harris Co., Harrison, N. J. Cutting knife is controlled by a photoelectric cell that assures cuts to exact length on each coil. Resistance specifications are met with variations not exceeding plus or minus 1 per cent.

Machine consists of four sub-

"TASK FORCE 'KEOKUK' AWAITING ORDERS, SIR!"
CHIEF KEOKUK: . . . and ready with Electro-Silvery to help industry attack problems of iron and steel production . . .
PRINCESS WENATCHEE: . . . like helping to make the metal that went into this tank and other products vital to the defense program . . .
CHIEF KEOKUK JR: Hey, Pop, what *is* Electro-Silvery?
CHIEF KEOKUK: Electro-Silvery, Son, is a form of ferro-silicon that acts as a vital control element in the production of iron and steel . . .
PRINCESS WENATCHEE: . . . and the largest producer in the world of this vital ingredient is Keokuk Electro-Metals Company!
Keokuk Electro-Silvery is used by foundries and steel plants in the form of these three pigs, weighing 60 pounds . . . 30 pounds . . . and 12½ pounds.
KEOKUK
ELECTRO-METALS COMPANY
KEOKUK, IOWA
WENATCHEE DIVISION: WENATCHEE, WASHINGTON
SALES AGENTS: MILLER AND COMPANY
332 S. Michigan Ave., Chicago 4, Illinois
3504 Carew Tower, Cincinnati 2, Ohio
915 Olive St., St. Louis 1, Missouri



H & S SPEED REDUCERS play a part

in side trimming

strip steel at

high speeds

• Cutting strip steel at high speeds is a tough job and Horsburgh & Scott Speed Reducers play an important role as part of the Wean Side Trimmers . . . available in various sizes for edge trimming hot and cold rolled strip from .006" to 3/8" thick. This is only one of the many fields in industry where H & S Speed Reducers are handling tough jobs for long uninterrupted periods with great savings in maintenance. It will pay you to talk with our engineers about your speed reduction problems.

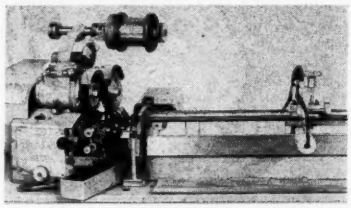
THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U. S. A.

Send note on Company Letterhead for Speed Reducer Catalog 46

assemblies: Coiling head—comprising the motor drive, speed control and coiling mechanism; cutting knife; horizontal coil-length control; and electronic knife control. First and last assemblies are self-contained, individual units that



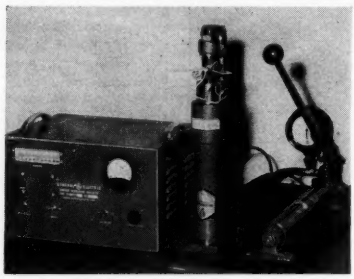
. . . synchronizes coil parts' rolling action

can be placed in the most convenient position for any given working location. Machine handles a full range of resistance coiling in closed or open winding. It can be adapted for twin wire coiling.

Surface Resistance Indicator

USE REPLY CARD—CIRCLE No. 7

Improved resistance welding bond, a result of rapid, accurate measurement of resistance between pieces of metal to be welded, should be gained by use of a portable surface-resistance indicator developed by General Electric Co., Schenectady 5, N. Y. Device supplies a sim-



. . . measures resistance between weld pieces

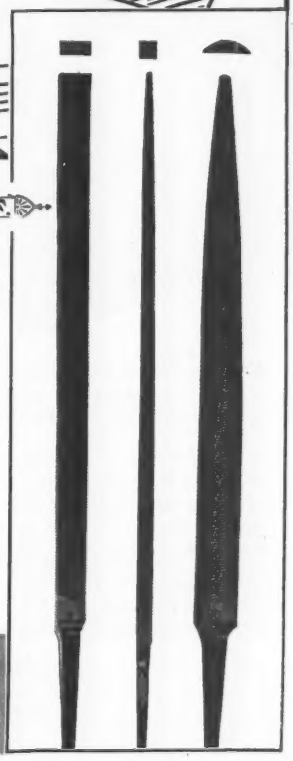
ple check on prewelding cleaning processes, upon which depends the metal's surface resistance.

Equipment comprises two parts: Microhmmeter and a sample holder. In operation, sample pieces of metal to be welded are placed between jaws of the sample holder and subjected to desired pressure. Surface resistance between metal samples is indicated on the microhmmeter.

Unit has two ranges: 0 to 200 and 0 to 2000 microhms. Measured resistance is indicated directly in

POP'S school of Filing

AIN'T THAT JUST LIKE STOOP? HE SAYS THE FINS ON THAT DIE CASTING REMIND HIM OF THE ALPS! SO HE'S KNOCKIN' 'EM OFF WITH A SWISS PATTERN FILE!
SWISS PATTERNS ARE FINISHING FILES--WHICH IS WHAT STOOP WILL BE WHEN POP CATCHES HIM.
HE'LL GET THE POINT-- RIGHT WHERE HE DON'T WANT IT!
STAN RANDALL



LIKE most production-wise foremen, Pop is a bug on tools. He knows that Nicholson X.F. (Extra Fine) Swiss Pattern Files, for example, are the finest finishing files you can buy. And heaven help the man who uses 'em on the wrong jobs!

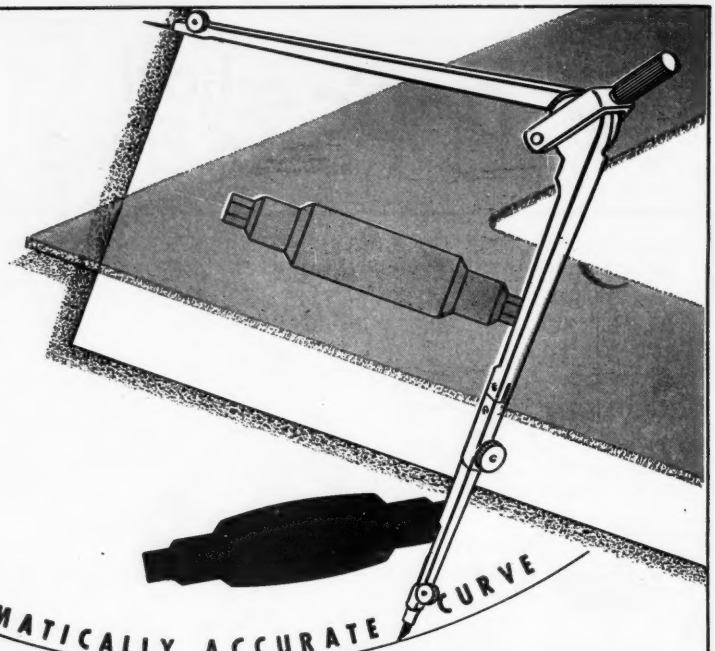
Nicholson Swiss Pattern Files are widely used for removing burs left from previous machining operations, rounding out slots, smoothing small parts, and final finishing on all sorts of delicate and intricate pieces. They come in seven degrees of coarseness, scores of shapes and sizes. Available through your industrial distributor.

Send for the Nicholson booklets, **"Ten Special File Types"** and **"File Filosophy."** They're FREE.

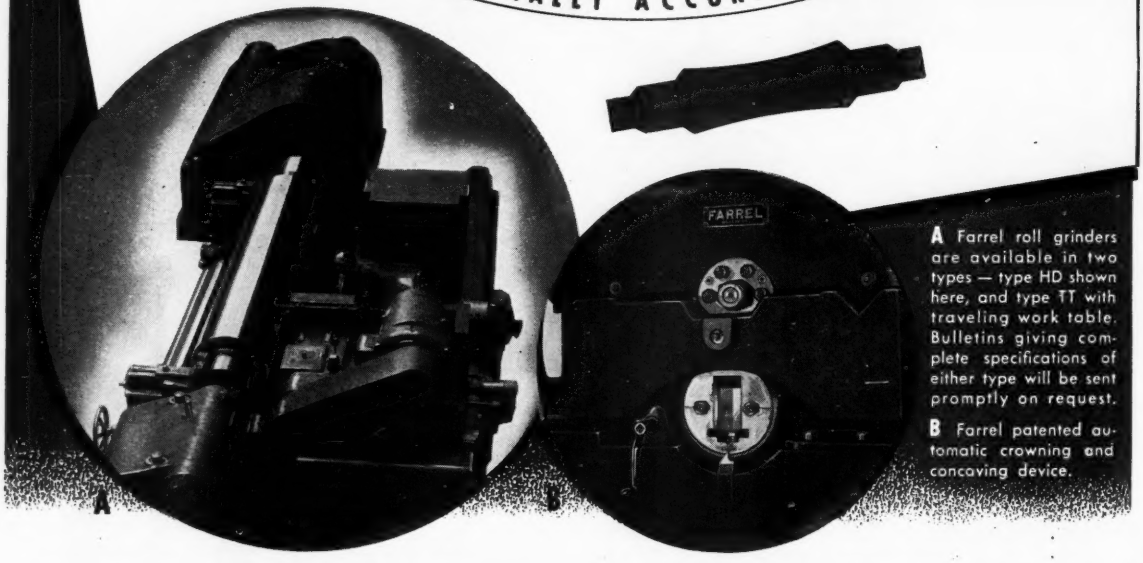
NICHOLSON FILE CO. • 71 ACORN STREET, PROVIDENCE 1, R. I.
(In Canada, Port Hope, Ont.)

NICHOLSON... *a file for every purpose*

HOW TO GRIND YOUR ROLLS WITH A



MATHEMATICALLY ACCURATE CURVE



A Farrel roll grinders are available in two types — type HD shown here, and type TT with traveling work table. Bulletins giving complete specifications of either type will be sent promptly on request.

B Farrel patented automatic crowning and concaving device.

If you are having trouble in obtaining a truly accurate crowned or concaved contour on your rolls, a Farrel grinder will provide the solution to your problem.

Farrel roll grinders are equipped with an automatic device, a built-in "brain," which guides the grinding wheel along a perfectly graduated, mathematically accurate curve. Crowned or concaved rolls are ground with both halves perfectly symmetrical.

This device is the adjustable, single eccentric type, designed for ease and simplicity of setting. It assures exact synchronism between wheel carriage and wheel.

The same setting invariably produces exactly the same curvature, permitting uniform and easily controlled accuracy of contour in all rolls.

Accurate "curve control" is only one of the many outstanding features of Farrel roll grinders. Write for descriptive bulletin.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Chicago, Los Angeles, Houston

Farrel-Birmingham®

FB-706

microhms on a linear 100-division scale. Voltage fluctuations in the supply mains do not affect this reading.

Carton Clamp Attachment

USE REPLY CARD—CIRCLE No. 8

Carton clamp made to permit efficient unpalletized handling of a wide variety of different size pieces is available from Philadelphia Division, Yale & Towne Mfg. Co., Philadelphia 15, Pa. Clamp arms are articulated to equalize pressure on the carton being lifted. Adjustable regulator on the hydraulic system permits clamping pressure adjustment over a wide range. This regulator also prevents crushing of the cartons by limiting clamping pressure.

. . . handles different sizes without pallets

Surge Control Means Even Flow

USE REPLY CARD—CIRCLE No. 9

Even flow of materials from its air-operated handling pumps results from a surge control unit developed by Binks Mfg. Co., 3112 Carroll Ave., Chicago 12, Ill. Control shuts off the pump's supply of compressed air automatically the instant its spray gun is closed. Pump resumes operation instantly when the gun is opened.

Its action eliminates the spurts or globs that occur when a pump continues to operate and pressure builds up higher than normal after an operator shuts off the gun. Its effect is to prevent material waste and the resulting uneven coat. Another effect can be to extend life of the pumping mechanism and material hose. Its

the A-B-C of M-S-T

A ALWAYS MAKES POSSIBLE
B BETTER PRODUCTS
C AT LOWER COST

Michigan
Electric Resistance
WELDED
STEEL
TUBING

A Quality Product

ROUND
⅜" to 4" O. D. 9 to 22 gauge
SQUARE-RECTANGULAR
½" to 2" 20 gauge, 1" to 2¾", 14, 16, 18 gauge
Carbon 1010 to 1025

Michigan Tubing
has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Steering Jacket

Ready for the automobile assembly line is this vital volume produced tubular part of a major control unit.

Lower tube end is reduced to 2.260" O. D. x 10.525" long, held to close tolerance for assembly in line with body of base tube without machining. Upper end is reduced to 2.125" O. D. x 2.562" long, held on center line to extremely close decimal dimensions, with two perforations at tapered section. Michigan workmanship can always be depended upon to assure the exacting tolerances and part uniformity to keep customer assembly operations moving smoothly.

Michigan engineers will be pleased to work with you on an adaptation of welded steel tubing to help you make your product better at lower cost.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Plus Fabricating of our own tubing Michigan is interested ONLY IN THE FABRICATION OF Stainless steel, copper, brass and aluminum tubing.

Michigan STEEL TUBE PRODUCTS CO.
THE OLDEST NAME IN ELECTRIC RESISTANCE WELDED STEEL TUBING

More than 35 Years in the Business
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DISTRIBUTORS: Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland Co., Dayton, Ohio—Dirks & Company, Portland, Oregon—James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—Hugh Davis, Jr., Sewickley, Pa.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—Globe Supply Co., Denver, Colorado—W. A. McMichaels Co., Upper Darby, Pa.—A. J. Fitzgibbons Co., Buffalo, N. Y.—Harry E. Clark & Co., Houston, Texas—J. B. Beaird Co., Inc., Shreveport, La.

design makes a dumping device to relieve excessive material pressure in the hose unnecessary.

Grinder Works Small Radii

USE REPLY CARD—CIRCLE No. 10

Small radius contour grinder and polisher, the model 400, is offered by Curtis Machine Division, Lincoln Park Industries Inc., 1300 E. Second St., Jamestown, N. Y. Compact machine is 46 inches high, 18 x 24 inches at the base. Standard ½-inch sealed ball bearing spindle design permits quick change of contact wheels having various width, shape, diameter and durometer. Positive tracking mechanism provides tracking of coated abrasive belts from ¼ to 2-inch widths. Standard belt length is 111 inches.

Adjustable contact wheel arm permits either sitting or standing operation, with adjustment of 30 to 38 inches from floor level. Spring tensioning of the solid cast aluminum offers positive belt control at all times.

Air Drill Line Expanded

USE REPLY CARD—CIRCLE No. 11

Guibert Steel Co., Box 1837, Pittsburgh 30, Pa., announces addition of an air-powered unit to its line of Togglebug drills. Model is made with a standard air motor capable of variable spindle speeds from 150 to 600 rpm. It operates on 100-pound pressure, consuming 150 cu ft of air at maximum load.

Adequate air can be supplied for efficient operation by use of a ¾-inch line. Model meets demands for drilling, reaming and countersinking up to 2¼ inches. Applications in field operations where electric power is unavailable are indicated.

. . . has variable speed from 150 to 600-rpm

Lightweight Rotary Actuator

USE REPLY CARD—CIRCLE No. 12

Flexible shafting in remote operating mechanisms can be driven by a lightweight rotary actuator introduced by Hydro-Aire Inc., Burbank, Calif. Motor is capable of operating at all altitudes up to 50,000 feet and through an ambient temperature range of minus 65 to plus 200° F. Output is rated at 13 pound-inches at 2900 rpm of the output shaft. Limit switches control output shaft turn and a three phase alternating current brake stops the shaft within about 10 turns.

Unit operates on 220-v, 400-cycle, 3-phase ac current. Motor is fully protected against thermal

Good for many years at hard labor

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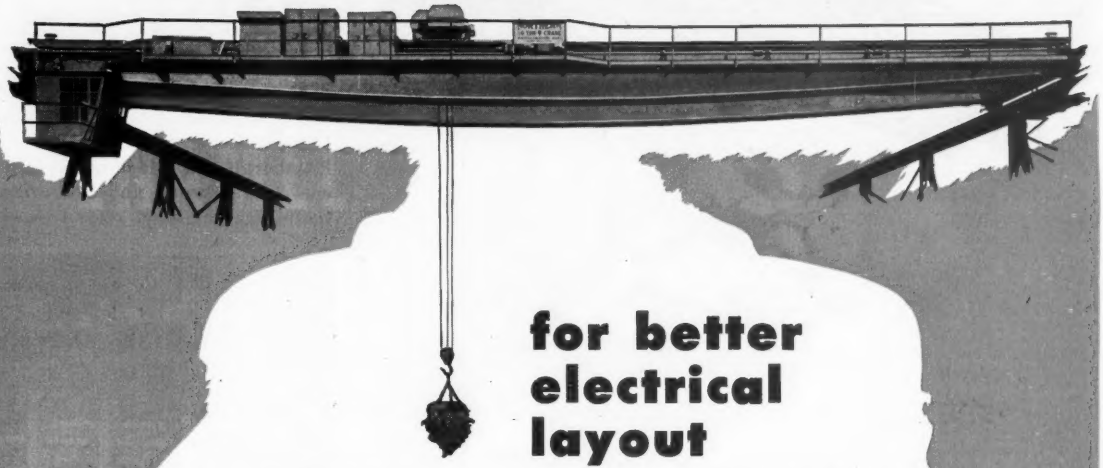
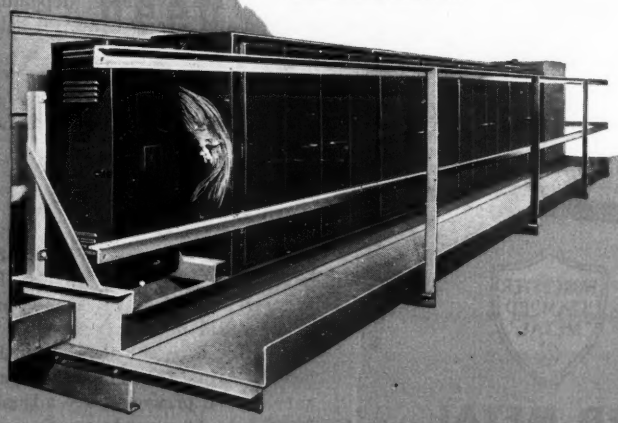
Northern Cranes

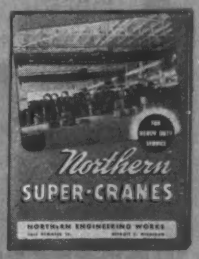


for better electrical layout

- Magnetic control panels mounted on a common support and wired as a unit greatly simplifies crane assembly, accessibility and maintenance.
- All wires, where possible, contained in metal raceways having movable covers.
- All Northern Cranes are completely wired at factory with solderless connectors, to eliminate the usual field soldering.
- Unit-welded steel construction, heavy duty roller bearings, transmission gear reductions, minimized wear on moving parts, easy accessibility, quick lubrication, simplified maintenance, and many other features reflect our experience of over 50 years in crane engineering and manufacture.



Write for new Super-Crane Bulletin SB-108-160



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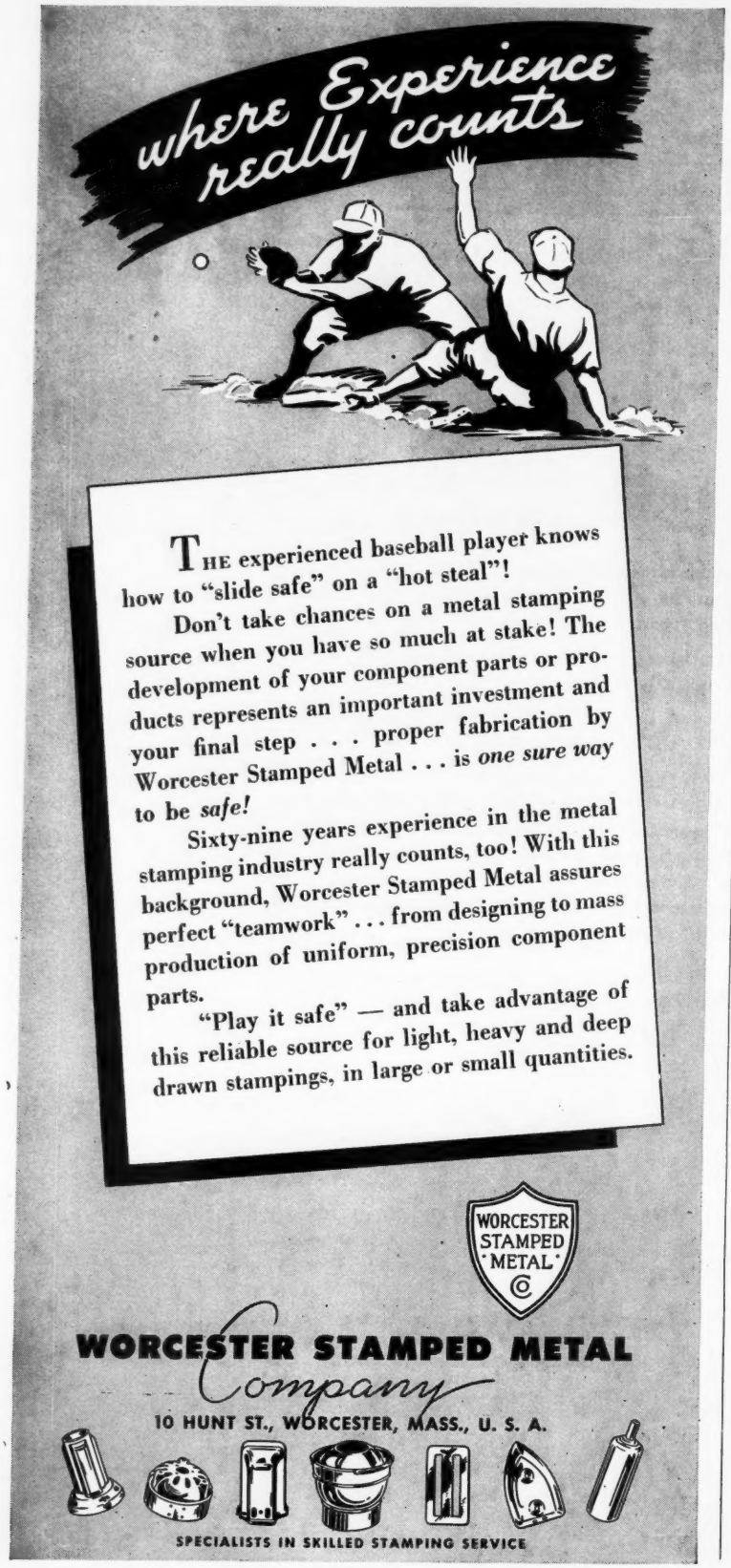
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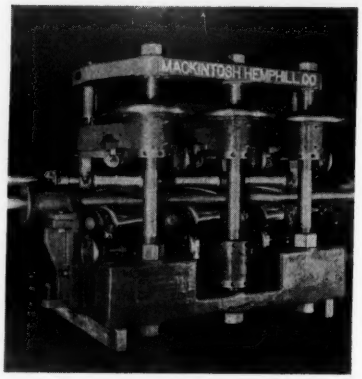
overloads, internal condensation and entrance of foreign matter. Horsepower is rated at 0.6.

Guideless Rotary Straightener

USE REPLY CARD—CIRCLE No. 13

Addition of the model AN to its line of guideless rotary straighteners is announced by Mackintosh-Hemphill Co., 901 Bingham St., Pittsburgh, Pa. Machine straightens both ferrous and nonferrous tubing, taking steel sizes from ½



. . . model works ferrous, nonferrous tubing

to 1¾-inch OD; brass, copper and aluminum thin wall tubing in sizes to 3-inches OD.

Two high-speed, silent chain type drives, actuated by two 10-hp direct current motors drive six forged and hardened alloy steel rolls. Production speeds of 40 to 400 fpm are available, depending on type and size of material being straightened.

Closed offset center pass principle is employed. Guideless design helps assure high surface quality of tubing.

Chemical Injector Pump

USE REPLY CARD—CIRCLE No. 14

Texsteam Corp., 320 Hughes St., Houston 11, Tex., offers its high pressure chemical injector pump, model MSM 5001. Pump will inject a liquid chemical into another liquid against 20,000 pounds pressure. Feed pressures are adjusted from 5 to 50 pounds to give output pressures of 100 to 20,000 pounds. Liquid discharge volume can be set accurately to deliver ½-pint to 360 gallons over a 24-hour period.

Pump weighs 62 pounds. It is supplied with ¼ or ½-inch stellite pistons and valves when used for

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If you have trouble finding the right stripper to remove the coating on your work, Enthone will be glad to select the right one from the many they make or will formulate a new one that will meet your requirements.

All you have to do is fill out a questionnaire which will be sent you on request, send this to us with typical samples of your work. Enthone Research Chemists will make the necessary tests and tell you how your problems can be solved. There is no charge for this service.

Enthone Research Chemists have developed over a score of strippers for organic finishes and are constantly seeking better methods.

Write for Enthone check list on over sixty products and processes for better electroplating and metal finishing.

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H & D merchandising packages offer manufacturers every opportunity to build goodwill, increase sales, and reduce costs. Here is an excellent example of "fact-packaging." Selling points and identification are printed in color on the lids of these counter-display packages to help the customer serve himself . . . to provide selling facts for the sales clerk.

Perhaps there's an idea here to make your merchandising job much easier . . . to give your product every advantage at the retail level. For the complete story, call in an H & D Package Engineer. A 14-volume "Little Packaging Library" is yours upon request to Hinde & Dauch, 5220 Decatur Street, Sandusky, Ohio.

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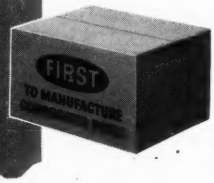
Authority on Packaging



Akron, Baltimore, Battle Creek, Mich., Bloomington, Ill., Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Denver, Detroit, Fairfield, Conn., Findlay, Ohio, Gloucester City, N. J., Greensboro, N. C., Hoboken, Indianapolis, Jamestown, N. Y., Kansas City, Lenoir, N. C., Minneapolis, Omaha, Plymouth, Ind., Reading, Pa., Richmond, Va., Roanoke, Va., Rochester, Sandusky, Ohio, Shrewsbury, Mass., St. Louis, Toledo, Watertown, Mass.

sustained high pressure. For lower pressures, 1-inch stainless steel pistons and valves are used.

Hand Dump Truck

USE REPLY CARD—CIRCLE No. 15

Palmer-Shile Co., Detroit 27, Mich., offers a hand dump truck designed to catch turnings from screw machines, holding scrap and other uses. Made of heavy sheet steel, reinforced with flange along top edge, it measures 25¾ x 45 inches at the top and 25¾ x 27 inches at the bottom.

Mercury Transformers

USE REPLY CARD—CIRCLE No. 16

Jefferson Electric Co., Bellwood, Ill., offers two types of 1000-w mercury transformers: One for operation of the H-12 lamp, the other for the H-15 lamp. Each line includes transformers for operation on 115, 230 and 460 v circuits.

Isometric Template

USE REPLY CARD—CIRCLE No. 17

No. 123 isometric template, introduced by Rapidesign Inc., Glendale, Calif., features a slot arrangement that permits all three axes to be drawn without turning the template. Template need be turned only when ellipses in a different elevation are required. It contains 38 ellipses from ⅛ to 1 9/16 inches.

High Pressure Gage Snubbers

USE REPLY CARD—CIRCLE No. 18

Porous stainless steel gage snubbers that utilize a porous stainless steel disk for damping pulsating pressures have been redesigned for high pressure service by Equipoise Controls Inc., Bronxville, N. Y. They are made in two sizes, ¼ and ½-inch SPT.

Centrifugal Fan

USE REPLY CARD—CIRCLE No. 19

A nonoverloading centrifugal fan that is said to be 90 per cent efficient with only one-third the noise intensity of previous models, is available from Sturtevant Division, Westinghouse Electric Corp., Pittsburgh 30, Pa. Designed for industry, power and commercial building needs, fan ranges in wheel sizes from 40¼ to 108¾ inches

SAVE splice **#1**

– to direct burial runs

SAVE splice **#2**

– to overhead runs

SAVE splice **#3**

– to duct runs

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LIGHTER. May be used in self-supporting aerial assemblies.

TOUGHER. Special neoprene jacket resists abrasion, mechanical injury, moisture, corrosion, sunlight, organic decay. No sheath electrolysis.

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LESS COSTLY TO STOCK. One cable – versatile Durasheath–meets all electrical distribution needs.

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Durasheath is normally stocked for applications up to 5,000 volts, and is available on order for higher voltages, for traffic control, airport† power and lighting, mines, industrial plants, railroads, street lighting and many other uses. See your Anaconda Representative. Ask for quotations. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York. 52370A

†When ordered to CAA Specification L-824

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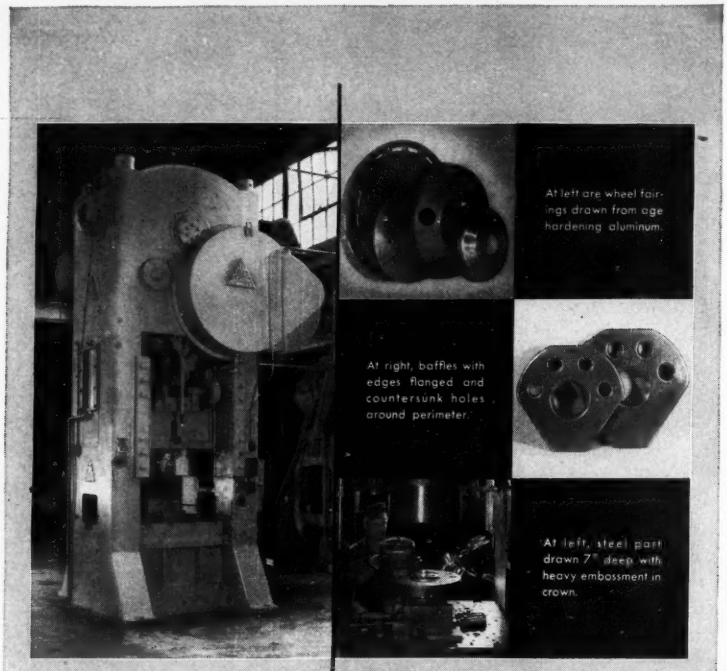
At left are wheel fairings drawn from age hardening aluminum.
At right, baffles with edges flanged and countersunk holes around perimeter.
At left, steel part drawn 7" deep with heavy embossment in crown.

VARIETY SHOW

From 13 gauge to one-half inch plate . . . From hot rolled steel to age hardening aluminum . . . Whatever the task assigned to it, this Clearing 400 ton crankless press has been giving dependable service for more than ten years at Leake Stamping Company of Monroe, Michigan. Clearing presses are built to give dependable performance with low maintenance costs whatever the production requirements may be.

It's always a good idea to look to Clearing for help whenever your production problems involve the forming of metal.

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CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

diameter and is capable of delivering volumes of up to 600,000 cfm.

Dial Test Indicator

USE REPLY CARD—CIRCLE No. 20

Universal dial test indicator, developed by Lufkin Rule Co., Saginaw, Mich., has one-piece construction of the base and shanks so that assembly will not be loosened under severe use. All greasing and oiling are eliminated. Indicator's light weight makes it adaptable for use with height gage or surface gage.

Hydraulic Swivel Joints

USE REPLY CARD—CIRCLE No. 21

A complete standardized line of high pressure hydraulic swivel joints for general industrial use with tubing or pipe is offered by Barco Mfg. Co., Chicago 40, Ill. The self-aligning joints are made in four different styles with straight or angle connections for use with ¼, ⅜, ½ or ⅝-inch tubing or equivalent size pipe.

Flow-Rate Regulator Control

USE REPLY CARD—CIRCLE No. 22

Designed for use wherever liquids are handled, a flow rate regulator control is offered by W. A. Kates Co., Deerfield, Ill. It is adapted to such jobs as blending and proportioning, solvent extraction, controlling filter effluent, water treatment and deionizing. It is available with standard capacities ranging from 0.1 to 100 gallons per minute.

Centralized Safety Control

USE REPLY CARD—CIRCLE No. 23

Centralization of combustion safeguard equipment for two to 16 burners can be accomplished with the multiple burner Protect-O-Glo system introduced by Industrial Division, Minneapolis-Honey-

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71. Safety Valve

Danielson Safety Valves, Inc.—Whipping air lines caused by disconnecting tools can be eliminated by installation of this safety air check valve, described and illustrated in 6-page folder. It is made in various sizes and is tested to 3000 psi. Valve uses no springs or gaskets, therefore does not wear.

72. Variable Transformer

Superior Electric Co.—Complete with photos, outline dimensions, ratings and other descriptive material, 4-page illustrated bulletin P252 covers the Powerstat type 10 variable transformer which will handle variable alternating current voltage control problems involving 50, 100 and 150 w.

73. Snap-Type Fasteners

Shakeproof Inc. — Thicknesses up to ⅛-in. can be fastened by Shakeproof Snap Fastener which speeds assembly and requires no tools. Fastener, described and illustrated in 4-page bulletin, is merely pushed through prepared holes that are slightly larger than the fastener shank. Also covered in bulletin are Keps preassembled lockwasher-nuts and Springrip washers.

74. Aluminum Paint

Skybryte Co.—"Choose and Use the Correct Aluminum Paint" is self-explanatory title of 4-page folder which emphasizes the usefulness of five different aluminum paints. Outlined are rust-resistant paint known as Fence-Bond; heat-resisting exterior and interior paints; and an acid and alkali-resistant aluminum, together with a utility aluminum paint.

75. Steel Strapping

Signode Steel Strapping Co.—Completely revised, 40-page illustrated catalog No. 15 on steel strapping, seals, tools, accessories and applications embodies latest changes in designation and full description of new products produced since 1949. Selected case histories on specific use of steel strapping are reproduced, and charts showing size and tensile strengths of strapping along with other pertinent data.

76. Power Hack Saws

Sales Service Machine Tool Co.—Photographs, specifications, features and other data for line of Keller power hack saws are included in 4-page catalog. Capacities range from 4 x 4 in. to 6¾ x 6¾ in. Data on accessories is included.

77. Air-Operated Chucks

Redmer Air Devices Corp.—16-page spiral bound illustrated catalog describes extensive line of index and collet type air chucks for use on various machine tools. Specifications for all models, suggested applications, advantages accruing from use and data on control equipment are included.

78. Precision Drill Press

South Bend Lathe Works—Well illustrated 4-page bulletin 401-AE is descriptive of the 14-in. floor type precision drill press. Features are pictured and described and specifications are listed. Many attachments and extras available for use with the drill press are covered.

79. Production Control

Remington Rand Inc.—Combined use of punched card tabulating equipment, Sched-U-Graph and Kardex units for an effective production control system is subject of Narrator No. 801 bulletin. An entire payroll, as well as labor and materials distribution, are produced by the tabulating department. Its enlightening!

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80. Drill Rods

Solar Steel Corp.—Typical analysis, uses, sizes and tolerances of Sure Spec high grade tool steel in rounds, flats and special shapes comprises information to be found in 12-page brochure.

81. Aluminum Mill Products

Reynolds Metals Co.—Found in 12-page illustrated brochure "Reynolds Aluminum-Mill Products" are sections on advantages of wrought aluminum alloys, alloy selection guide and material on fabricating and finishing. List contains helpful literature available.

82. Controlled Volume Pumps

Milton Roy Co.—Details of construction, operation and application of line of air-powered controlled volume pumps are found in illustrated bulletin No. 351, containing 16 pages. Cutaway views of pumps and diagrams of controls and typical air-powered system are included. Pumps handling from 0.4 to 405 gph against discharge pressure up to 21,000 psi are covered.

83. Presetting Gages

Scully-Jones & Co.—If you use presetting gages, you will be interested in 4-page illustrated catalog No. 19-50 which lists standard stock sizes of flush pin and height gages for setting tools used in multiple spindle machines. Also included is the dope on special combination tool board and bench, designed and built as a part of most tool gaging setups.

84. Power Presses

Sales Service Machine Tool Co.—Press-Rite line of open back inclinable power presses is described and illustrated in 8-page bulletin P650. Detailed specifications for 5, 10, 12, 18, 30 and 85-ton models are included. Two-page auxiliary bulletin gives the same info on the No. 60 OBI 60-ton press in the line.

85. Industrial Truck Power

Ready-Power Co.—If the answer to your materials handling problem is to be able to operate your electric trucks continuously, then you had better send for this 8-page illustrated bulletin 99 (revised) which tells of Ready-Power continuous duty power units. Examples are illustrated in various sizes and ratings for all types, sizes and makes of trucks.

86. Production Planning

System Layout, Inc.—Don't draw it—build it! That's what 6-page folder says concerning company's development in scale model layout construction for production planning. System saves thousands of man hours of drawing board time.

EDITORIAL REPRINTS:

87. Blast Furnace Practice

Last article of a series written by C. E. Agnew on blast furnace practice is now available in STEEL reprint form. This final article describes how furnace operating conditions can be created to permit use of oxygen-enriched air for increasing iron production with reduced blast and fuel. Reprints of the complete series comprising 19 installments are available for $1.00 per copy, postpaid.

88. Radiant Oven

STEEL reprint of brief report entitled "Radiant Oven Adapts to Job" talks about infrared oven panels made by Edwin L. Wiegand Co. which come ready to erect into oven structures and connect to plant wiring. Two panel sizes are available: 1 x 4 ft with capacity of 10.8 kw and 2 x 4 ft with 21.6 kw capacity.

89. Cast Iron Welding

Can nodular cast iron be electrically welded so it can be used in applications ordinarily restricted to welded steel castings? Annealing after welding and better welding method may do the trick, according to E. F. Davis and E. L. Layland who give some of the answers to this problem in STEEL reprint "Nodular Cast Iron Welds Hard to Machine."

90. Proper Cutting Fluids

Applying the right fluid in the right manner to your machining operation is one secret to efficient production. Factors include metal, cutter and operation. R. F. Huber, Assistant Editor, in STEEL reprint "Proper Cutting Fluids Can Step Up Machining" discusses some of the different coolant oils and their particular application. Tabulated cutting fluid recommendations are given as well.

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7	17	27	37	47	57	67	77	87
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well Regulator Co., Philadelphia 44, Pa. System features individual flame detecting relays for each burner housed in a single cabinet. Cabinet also houses pushbuttons, signal lights and other parts.

Coolant for Honing

USE REPLY CARD—CIRCLE No. 24

Pelron Corp., Lyons, Ill., has developed a water soluble coolant for honing. No. 560 contains a high percentage of liquid detergent, an extreme pressure agent and a rust preventive. It is noninflammable and nonvolatile.

Anode Basket

USE REPLY CARD—CIRCLE No. 25

Forcite anode basket, available from R. O. Hull & Co. Inc., Rocky River 16, O., is designed for complete solution of scrap or ball anode material and may be used in nickel, copper, lead and all cyanide baths. Its tapered construction gives continuous electrical contact to the anode without requiring replacement of contact anodes.

Paint Primes, Seals, Finishes

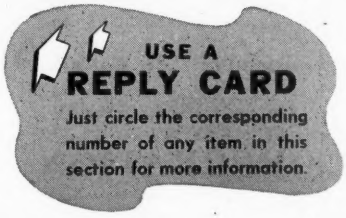
USE REPLY CARD—CIRCLE No. 26

Hydrocide Colorcoat, a paint that primes, seals and finishes highly porous masonry surfaces in one application is announced by L. Sonneborn Sons Inc., New York 11, N. Y. It can be applied by brush or spray. Paint is available in six colors.

Clamp-Type Volt Ammeter

USE REPLY CARD—CIRCLE No. 27

Type AC-1 volt-ammeter, a clamp-type, hand-sized measuring instrument that measures volts and amperes instantly, is available from Columbia Electric Mfg. Co., Cleveland 14, O. Readings are made without breaking circuit or insulation. Four amperage ranges are available: 0-12, 0-60, 0-120, 0-600 ac amp.



Angier

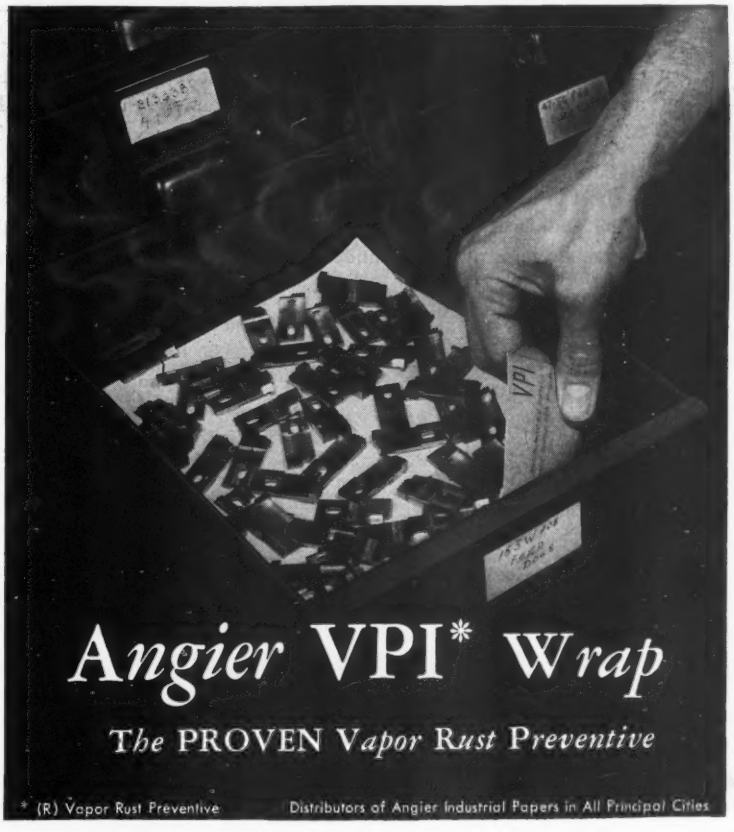
How Vapor from Paper Stops Rust of Parts in Storage

Problem: To find a simple way to keep sewing machine attachments bright and shiny in a plant atmosphere that accelerates corrosion for two reasons. (1) Certain manufacturing operations create acid fumes and (2) the plant is located at the ocean's edge.

Solution: The firm discovered the chemical coated paper that gives off a vapor to stop rust—Angier VPI* Wrap. The paper is used simply as a liner for drawers (see photo), for trays, boxes or bins—or as envelopes. The vapor permeates the area in the container and robs aid and moisture of its rust-making powers. Now the shiny machine attachments stay bright for months at a time. No refinishing is necessary for these VPI-stored parts in process or for completed parts that are ready to ship.

To get "VPI Facts", check below the products stored or shipped by you. Send today to the most experienced name in vapor rust preventives—Angier Corporation, Framingham 8, Mass.

☐ Machinery-Industrial, Metal Working, Farm, Office, Construction.
☐ Steel in process of fabrication.
☐ Electrical Machinery, Appliances, Products.
☐ Instruments and clocks.
☐ Fabricated Products—Cutlery, Hardware, etc.
☐ Ordnance Equipment.
☐ Transportation Equipment—Aircraft, Auto, Naval, Railroad, etc
☐ Others:


VPI
Angier VPI* Wrap
The PROVEN Vapor Rust Preventive
* (R) Vapor Rust Preventive
Distributors of Angier Industrial Papers in All Principal Cities

YOU MAY save 3.15 POUNDS PER SHEET*

WITH

MicroRold®

STAINLESS STEEL

When you order sheet by gauge number the permissible A. I. S. I. variation in thickness is plus or minus 10%. Thusly, if you order 18 gauge, you may receive a sheet .052 thick when .0475 would suit your purpose. Using a standard 18 gauge 36″ x 120″ sheet as an example, the theoretical weight is 63 pounds, but this weight could permissibly vary between 65.52 pounds and 59.22 pounds.

A sheet of MicroRold .0475 thick with a tolerance of only 3% would weigh 59.85 pounds thus insuring a saving of 3.15 pounds from the theoretical average-weight, or 5.67 pounds from the maximum, while still remaining within the 18 gauge ordering range.

Weight of One Sheet of 18 Gauge 36″ x 120″ Plus or Minus 10%

.052″—65.52 Pounds .051″—64.26 Pounds .050″—63.00 Pounds .049″—61.74 Pounds .048″—60.48 Pounds .047″—59.22 Pounds	Theoretical Wt. 63.00 Pounds

Weight of the same size sheet of .0475 plus or minus 3% is 59.85 pounds with an average saving of 3.15 pounds per sheet.

Multiply this saving by the number of sheets you use per month and the price per pound and you have a good dollar and cents reason for buying MicroRold.

** Each additional 1/1000″ of thickness adds 1.26 pounds weight per sheet.*

WASHINGTON STEEL CORPORATION
WASHINGTON, PENNSYLVANIA

The Market Outlook

THE WORST is yet to come. That's the outlook on steel shortages resulting from the steelworkers' strike.

The bulk of the steel industry has been closed down five weeks but except for random cases steel users have been able to operate without difficulty. The steel users have been living off their inventories. Now, except for rare cases, the inventories are nearly depleted, or at least unbalanced.

TIME SCHEDULE—It will take ten days to get mills back to capacity operations and start steel flowing from them. And there is less than the normal amount of steel on mill floors ready for shipment once the plants are opened; the strike was anticipated and every effort was exerted to make shipment, and through government efforts some high-priority steel that had been strike-bound was moved out to consumers. The result: It'll take ten days to two weeks to get a full flow of steel started.

Work resumption in the steel mills will set off clamors for preference in deliveries. Don't be surprised if the government requires that high-priority defense orders be given first attention. This would cause a further delay in replenishment of steel stocks of civilian goods producers.

CUSHION—Easing the strike's impact on metalworking plants are their shutdowns now for a week or two of summer vacations.

Up to yesterday the steel loss from the steelworkers' work stoppages this year was 10,933,000 tons, the American Iron & Steel Institute calculates.

The stoppages cut the nation's output of steel for ingots and castings in the first half of this year 7.2 million net tons below that of the comparable period of 1951. Last year, production in the first half was 52.3 million net tons. This year it was approximately 45.1 million tons.

CARRYING ON—Production in unstruck plants rose one-half point last week to 12.5 per cent of capacity. This rate was equivalent to 260,000 tons.

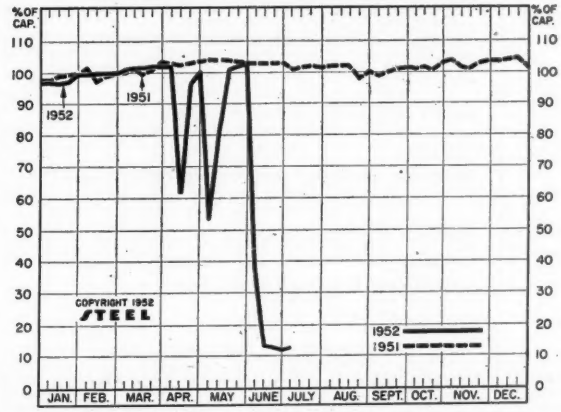
The steel work stoppages not only have disrupted production but they have delayed completion of steel industry expansion projects. This was to have been the big year for bringing new capacity into operation. U. S. Steel Co. estimates construction of its new steel plant at Morrisville, Pa., is four to five months behind schedule. Blast furnaces will not start until this fall and full production on tin plate, sheets, pipe and bars will not be reached until next summer. When the project was started it was hoped that some flat-rolled production might be started at least by the third quarter of this year. Accounting largely for the delay are engineering changes, materials shortages and bad weather.

GETTING READY—Nevertheless, buying of scrap for the Morrisville plant has begun and shipments are starting. Material will be stocked pending operation of the new open-hearth department. Scrap for blast furnaces has not yet been reported ordered. Purchase of open-hearth grades of scrap tended to stabilize and strengthen the market for them in the East. As a result STEEL's steelmaking scrap composite rose to $42.33 from $41.50. Just before the steel strike, demand for steelmaking grades of scrap weakened in the face of growing stockpiles. When the strike choked off scrap consumption, the market softened even more.

ACCENTUATED—As the strike wore on it intensified the shortage of steel bars and plates, the most difficult of all steel products to get. It's likely some producers will be unable to take any more orders for this year's delivery of bars and plates. The supply stringency will be felt in varying degrees on other steel products too. Indicative of the increasing concern over steel supplies is the move by consumers to snap up offers of off-grade sheets.

STRAW IN THE WIND—A sign of things to come is Weirton Steel Co.'s application to the government for permission to increase its steel prices $5.50 a ton to help cover a 25-cents-an-hour wage increase given its employees. Weirton estimates its increase in production costs will average $10 a ton. It would absorb $4.50 of it.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended July 5	Change	Same Week 1951	Same Week 1950
Pittsburgh	5	+ 3	95.5	94.5
Chicago	7	— 0.5*	106.5	98
Mid-Atlantic	17	1	90	96.5
Youngstown	0	0	105	105
Wheeling	50	— 1.5	93.5	93
Cleveland	0	0	100.5	52
Buffalo	0	0	104	104
Birmingham	0.5	0	100	100
New England	20	+ 2	91	60
Cincinnati	32	0	106	90
St. Louis	31	+ 9	84.5	78
Detroit	49	+12	101	104
Western	33	0	103.5	98
Estimated national rate	12.5	+ 0.5*	101	94

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 53 *Production-Engineering News—p. 89*

Composite Market Averages

	July 3 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100) ..	171.92†	171.92†	171.92†	171.92	118.67
Index in cents per lb.	4.657†	4.657†	4.657†	4.657	3.215
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32†	$106.32†	$106.32†	$106.32	$69.82
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	52.54	32.99
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	32.49
Malleable Pig Iron, GT ...	53.27	53.27	53.27	53.27	33.71
Steelmaking Scrap, GT ...	42.33	41.50	43.00	44.00	35.08

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Preliminary, pending 1952 tin plate contract price announcement.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	July 3 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelphia	4.252	4.252	4.252	4.20	2.98
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh ..	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia ..	3.93	3.93	3.93	3.91	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa. ...	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh ..	3.60–75	3.60–75	3.60–75	3.60–75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh ..	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh ..	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh ...	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh ...	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh ...	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate box, Pittsburgh..	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, ½"-⅜", Pitts. ..	4.10–30	4.10–30	4.10–30	4.10–30	2.55

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$34.00
Basic, Valley	52.00	52.00	52.00	52.00	33.00
Basic, del. Phila.	56.75	56.75	56.75	56.49	35.72
No. 2 Fdry, Pitts.	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, del. Phila. ...	57.25	57.25	57.25	56.99	36.54
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	29.88
No. 2 Fdry (Birm.) del. Cin.	56.43	56.43	56.43	55.33	34.75
Malleable, Valley	52.50	52.50	52.50	52.50	33.50
Malleable, Chicago	52.50	52.50	52.50	52.50	33.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	43.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.25*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts...	$44.00	$44.00	$44.00	$45.00	$34.75
No. 1 Heavy Melt, E. Pa...	40.50	38.00	42.50	43.50	36.75
No. 1 Heavy Melt, Chicago.	42.50	42.50	42.50	43.50	33.75
No. 1 Heavy Melt, Valley..	44.00	44.00	44.00	45.00	35.00
No. 1 Heavy Melt, Cleve...	43.00	43.00	43.00	44.00	33.75
No. 1 Heavy Melt, Buffalo.	37.00*	37.00*	43.00	44.00	33.50
Rails, Rerolling, Chicago...	52.50	52.50	52.50	52.50	40.50
No. 1 Cast, Chicago	45.00	45.00	45.00	49.00†	39.00

* Nominal. † F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connisvl. ..	$14.75	$14.75	$14.75	$14.75	$9.50-10.50
Beehive, Fdry, Connisvl. ..	17.50	17.50	17.50	17.50	9.75–12.00
Oven Fdry, Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	21.50
Zinc, E. St. Louis	15.00	15.00	16.00	17.50	10.50
Lead, St. Louis	15.80	15.80	14.80	16.80	14.80-14.85
Tin, New York	121.50	121.50	121.50	106.00	80.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex. ..	39.00	39.00	39.00	42.00	33.00
Nickel, refinery, duty paid.	56.50	56.50	56.50	56.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
NewYork, del.	....	58.28	58.78	....
Newark, del.	57.02	57.52	58.02	58.52
Philadelphia, del.	56.75	57.25	57.75	58.25
Birmingham District				
AlabamaCity, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	56.43	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.65	63.15	63.65	....
Rochester, N.Y., del.	55.02	55.52	56.02	....
Syracuse, N.Y., del.	56.12	56.62	57.12	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.17	54.67	54.67	55.17
Muskegon, Mich., del.	....	58.80	58.80	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	59.75	60.25	....
Fontana, Calif. K1	58.00	58.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
LosAngeles, SanFrancisco, del. ...	60.16	60.66	....	....
GraniteCity, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax).....	54.65	55.15	55.65	....
Ironton, Utah C11	52.00	52.50	....	....
Geneva, Utah C11	52.00	52.50	....	....
LoneStar, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.87	53.87	54.37
McKeesRocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, Wilmerding, Monaca, del.	....	54.16	54.16	54.66
Verona, Trafford, del.	....	54.69	54.69	55.19
Brackenridge, del.	....	54.95	54.95	55.45
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb pigiets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL-PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.55
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, July 3, 1952; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ..$79.00
Munhall,Pa. U5 .....52.00
Seattle S24 .....73.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00
Seattle S24 .....80.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 .....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 ....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ..56.00

Carbon,Forging (NT)
Bessemer,Pa. U5 .....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah C11 .....66.00
Houston S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14.66.00
So.Duquesne,Pa. U5 ..66.00
So.SanFrancisco B3 ..85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 ....66.00
Conshohocken,Pa. A3..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston S5 .....78.00
Ind.Harbor,Ind. Y1 ...70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14.70.00
So.Duquesne,Pa. U5 ..70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ....103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ...82.00
So.Duquesne,Pa. U5 ..82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 ....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ..3.35

WIRE RODS
Alton,Ill. L1 .....4.40
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.90
Houston S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y. B11.4.10
Pittsburg,Calif. C11 ..4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2..4.20
Sterling,Ill.(1) N15 ...4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ...4.90
Worcester,Mass. A7 ...4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ...4.45
Lackawanna,N.Y. B2 ..4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 ....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 ....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 ....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah C11 .....3.65
Houston S5 .....4.05
Ind.Harbor,Ind. I-2 ...3.65
Johnstown,Pa. B2 ....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ...4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ...4.85
Phoenixville,Pa. P4 ...5.90
Portland,Oreg. O4 ....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5 W14.3.65
So.SanFrancisco B3 ...4.20
Torrance,Calif. C11 ....4.25
Weirton,W. Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 ....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 ..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Ind.Harbor,Ind. I-2 ...5.50
Ind.Harbor,Ind. Y1 ....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 ....5.50
So.SanFrancisco B3 ...6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 ....3.70
Clairton,Pa. U5 .....3.65
Fontana, Calif. K1 .....5.55
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 ....3.65

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 ....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 ....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah C11 .....5.65
Ind.Harbor,Ind. I-2 ...5.65
Ind.Harbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 ....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 ....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ...5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 ..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Ind.Harbor,Ind. I-2 ...4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland,c.l. (15) A10 .3.95
Ashland,l.c.l. (15) A10..4.45
Cleveland,c.l. R2 .....4.30
Warren,O.,c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky. (15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 .....4.15
Cleveland J5, R2.....3.70
Coatesville,Pa. L7 .....4.15
Conshohocken,Pa. A3 ..4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ..4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 .....4.40
Geneva,Utah C11 .....3.70
Harrisburg,Pa. C5 .....6.30
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5 W14..3.70
SparrowsPoint,Md. B2 ..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 .....4.00
Youngstown R2, U5, Y1.3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah C11 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11..3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 .....3.85
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 ....5.35
Gary,Ind. U5 .....4.30
Houston S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1 ..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1.....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....4.55
BeaverFalls,Pa. M12, R2 4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ....4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 ....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 ....5.10
Readville,Mass. C14 ....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa.(5) K3 ....5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12 ....5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ..5.40
Mansfield,Mass B5 .....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 ....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ...4.75
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4..4.85
Huntngtn,W.Va.(3) W7..5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3,4) B12 ...4.75
Williamsport(3) S19 ...5.00
Williamsport(4) S19 ...5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ...13.50
Dover(Wrght.Iron) U1. 12.25
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt) B14 12.20
McK.Rks.(Staybolt)L5 .14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ...13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.10
Ind.Harbor,Ind. I-2 ....4.40
Johnstown,Pa. B2 .....4.40
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.50
Niles,Calif. P1 .....5.05
Pittsburgh J5 .....4.40
SanFrancisco S7 .....4.85
Seattle B3, N14 .....4.45
So.Chicago R2, U5, W14.4.40
So.Duquesne,Pa. U5 ....4.40
Sparrows Point,Md. B2 ..4.40
Struthers,O. Y1 .....4.40
Torrance,Calif. C11 ....4.55
Warren,O. R2 .....4.40
Weirton,W.Va. W6 .....4.45
Youngstown U5, Y1 ....4.40

BARS, Reinforcing
(Fabricated; to Consumers)
Huntington,W.Va. W7 ..5.50
Johnstown, ¼-1" B2 ....4.75
LosAngeles B3 .....5.45
Marion,O. P11 .....5.00
Seattle B3, N14 .....5.55
So.SanFrancisco B3 ....5.45
SparrowsPt. ¼-1" B2 ..4.75
Williamsport,Pa. S19 ...5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.60
Ashland,Ky.(8) A10 ....3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ..4.00
Detroit M1 .....4.40
Ecorse,Mich.(8) G5 ....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah C11 .....3.70
GraniteCity, Ill. G4 .....4.30
Ind.Harbor,Ind. I-2, Y1.3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ..3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 .3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 .....3.60
WestLeechburg,Pa. A4 ..3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R. (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ..5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
Ind.Harbor,Ind. Y1 ....5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 .....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.65
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1 ..7.05
IndianaHarbor,Ind. I-2..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.85

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.85
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16	**Cu Alloy**	**Cu Fe**
Ashland,Ky. A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary,Ind. U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	**Field**	**Arma-ture**	**Electric**	**Motor**	**Dynamo**
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill. G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	**72**	**65**	**58**	**52**
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	**T-100**	**T-90**	**T-80**	**T-73**
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEET, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10

STRIP, Cold-Finished, Spring Steel (Annealed)	**0.26-0.40C**	**0.41-0.60C**	**0.61-0.80C**	**0.81-1.05C**	**1.06-1.35C**
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8: Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

STRIP, Hot-Rolled Carbon

Midland,Pa. C18	5.85
NewBrita,Conn.(10)	S15 3.45
Sharon,Pa. S3	5.85
Youngstown U5	5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10)	S15 5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)	S15 10.75
Carnegie,Pa.	S18 ....10.60
Cleveland	A7 ....10.00
Dover,O.	G6 ....10.50
Fontana,Calif.	K1 ....11.65
Harrison,N.J.	C18 ....10.60
Midland,Pa.	C18 ....10.60
NewBritn,Conn.(10)	S15 10.75
Pawtucket,R.I.(11)	N8..10.75
Pawtucket,R.I.(12)	N8..11.05
Sharon,Pa.	S3 ....10.60
Worcester,Mass.	A7 ....10.30
Youngstown	C8 ....10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8)	A10 ....3.75
Warren,O.	R2 ....4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O.	R2 ....5.25

TIGHT COOPERAGE HOOP

Atlanta	A11 ....4.05
Riverdale,Ill.	A1 ....3.90
Sharon,Pa.	S3 ....4.15
Youngstown	U5 ....3.75

WIRE, Tire Bead

Bartonville,Ill.(1)	K4 ..10.90
Monessen,Pa.	P16 ....11.40
Roebling,N.J.	R5 ....11.55

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
AlabamaCity	R2.. 5.70	5.95
Aliquippa	J5 .... 5.70	6.15
Atlanta	A11 .... 5.95	6.40
Bartonville(19)	K4 5.70	6.15
Buffalo	W12 .... 4.85	...
Cleveland	A7 .... 5.70	6.15
Crawfordsville	M8 5.95	6.40
Donora,Pa.	A7 .. 5.70	6.15
Duluth,Minn.	A7 .. 5.70	6.15
Fairfield	T2 .... 5.70	6.15
Houston,Tex.	S5.. 6.10	6.55
Johnstown	B2.... 5.70	6.15
Joliet,Ill.	A7 .... 5.70	6.15
KansasCy,Mo.	S5. 6.30	6.75
Kokomo	C16 .... 5.80	6.05
LosAngeles	B3 .. 6.65	...
Minnéqua	C10 .... 5.95	6.45
Monessen	P7 .... 5.95	6.40
Palmer	W12 .... 5.15	...
Pitts.,Calif.	C11.. 6.65	6.80
Prtsmth.(18)	P12 . 6.10	6.60
Rankin	A7 ..... 5.70	6.15
So.Chicago	R2 .. 5.70	5.95
So.S.Fran.	C10 .. 6.65	7.10
SparrowsPt.	B2 .. 5.80	6.25
Sterling,Ill.(1)	N15 5.70	6.15
Struthers,O.	Y1 .. 5.70	6.15
Torrance,Cal.	C11 6.65	...
Worcester	A7 .... 6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill.	L1 .... 8.65	8.90
Bartonville,Ill.	K4 8.55	8.80
Buffalo	W12 .... 8.55	8.80
Fostoria,O.	S1 .. 8.85	9.10
Johnstown,Pa.	B2 8.55	8.80
Monessen,Pa.	P16 8.55	8.80
Monessen,Pa.	P7.. 8.80	9.05
Muncie,Ind.	I-7 .. 8.75	9.00
Palmer,Mass.	W12.. 8.85	9.10
Portsmouth,O.	P12 8.55	8.80
Roebling,N.J.	R5.. 8.85	9.10
SparrowsPt.	B2 .. 8.65	8.90
Struthers,O.	Y1 .. 8.55	8.80
Worcester	J4, T6. 8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala.	R2 ..4.85
Aliquippa,Pa.	J5 .....4.85
Atlanta	A11 .....5.10
Alton,Ill.	L1 .....5.05
Bartonville,Ill.(1)	K4 ..4.85
Buffalo	W12 .....4.85
Chicago	W13 .....5.10
Cleveland	A7, C20 ....4.85
Crawfordsville,Ind.	M8..5.10
Donora,Pa.	A7 .....4.85
Duluth,Minn.	A7 .....4.85
Fairfield,Ala.	T2 .....4.85
Fostoria,O.(24)	S1 .....5.35
Houston	S5 .....5.25
Johnstown,Pa.	B2 .....4.85
Joliet,Ill.	A7 .....4.85
KansasCity,Mo.	S5 .....5.45
Kokomo,Ind.	C16 .....4.95
LosAngeles	B3 .....5.80
Minnequa,Colo.	C10 ....5.10
Monessen,Pa.	P7 .....5.10
Newark 6-8 ga.	I-1 ....5.50
No.Tonawanda	B11 ....4.85
Palmer,Mass.	W12 ....5.15
Pittsburg,Calif.	C11 ....5.80
Portsmouth,O.	P12 ....5.25
Rankin,Pa.	A7 .....4.85
So.Chicago,Ill.	R2 .....4.85
So.SanFrancisco	C10 ...5.80
SparrowsPoint,Md.	B2 ..4.95
Sterling,Ill.(1)	N15 ....4.85
Struthers,O.	Y1 .....4.85
Torrance,Calif.	C11 ....5.80
Waukegan,Ill.	A7 .....4.85
Worcester,Mass.	A7, T6.5.15

WIRE, Cold-Rolled Flat

Anderson,Ind.	G6 .....6.20
Buffalo	W12 .....6.35
Cleveland	A7 .....5.85
Crawfordsville,Ind.	M8..6.20
Detroit	D2 .....6.20
Dover,O.	G6 .....6.20
Fostoria,O.	S1 .....6.00
Kokomo,Ind.	C16 .....5.70
FranklinPark,Ill.	T6 ...6.20
Massillon,O.	R8 .....5.85
Monessen,Pa.	P16 .....5.85
Monessen,Pa.	P7 .....6.10
NewHaven,Conn.	D2 ...6.50
Pawtucket,R.I.(12)	N8..6.85
Trenton,N.J.	R5 .....6.15
Worcester,Mass.	A7 ....6.15
Worcester,Mass.	T6 ....6.50
Worcester,Mass.	W12 ...6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill.	K4 .....8.50
Monessen,Pa.	P16 .....8.50
Muncie,Ind.	I-7 .....8.70
Roebling,N.J.	R5 .....8.80
SparrowsPoint,Md.	B2 ..8.60
Johnstown,Pa.	B2 .....8.50

WIRE (16 gage)	An'l'd. Stone	Galv. Stone
Aliquippa	J5 ....10.15	12.15
Bartonville(1)	K4 .10.25	11.95
Cleveland	A7 ....10.25	12.15
Crawfrdsville	M8.10.30	12.00
Fostoria,O.	S1 ...10.40	12.00
Johnstown	B2 ...10.25	12.15
Kokomo	C16 ....10.25	11.95
Minnequa	C10 ...10.40	12.40
Palmer,Mass.	W12.10.25	12.15
Pitts.Cal.	C11 ...10.60	12.50
Prtsmth.(18)	P12.10.55	12.30
SparrowsPt.	B2..10.35	12.25
Waukegan	A7....10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa.	J5 .....6.25
Alton,Ill.	L1 .....6.45
Bartonville,Ill.(1)	K4 ...6.25
Buffalo	W12 .....6.25
Cleveland	A7 .....6.25
Donora,Pa.	A7 .....6.25
Duluth,Minn.	A7 .....6.25
Fostoria,O.	S1 .....6.25
Johnstown,Pa.	B2 .....6.25
LosAngeles	B3 .....7.20
Milbury,Mass.(12)	N6 ..8.05
Monessen,Pa.	P7, P16...6.25
Muncie,Ind.	I-7 .....6.45
Palmer,Mass.	W12 .....6.55
Pittsburg,Calif.	C11 ....7.20
Roebling,N.J.	R5 .....6.55
Portsmouth,O.	P12 .....6.25
So.Chicago,Ill.	R2 .....6.25
So.SanFrancisco	C10 ....7.20
SparrowsPoint,Md.	B2 ..6.35
Struthers,O.	Y1 .....6.25
Trenton,N.J.	A7 .....6.55
Waukegan,Ill.	A7 .....6.25
Worcester	A7, T6, W12..6.55
Worcester,Mass.	J4 ....6.75

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill.(1)	K4 ..8.90
Buffalo	W12 .....8.90
Chicago	W13 .....8.90
Cleveland	A7 .....8.90
Crawfordsville,Ind.	M8..8.95
Fostoria,O.	S1 .....8.90
Johnstown,Pa.	B2 .....8.90
Kokomo,Ind.	C16 .....8.90
Monessen,Pa.	P16 .....8.90
Muncie,Ind.	I-7 .....9.10
Palmer,Mass.	W12 ....9.20
Portsmouth,O.	P12 .....8.90
Roebling,N.J.	R5 .....9.20
Waukegan,Ill.	A7 .....8.90
Worcester,Mass.	A7, T6.9.20

WIRE, Barbed	Col.
AlabamaCity,Ala.	R2 ...137
Aliquippa,Pa.	J5 141
Atlanta	A11 144
Bartonville,Ill.(19)	K4 ...144
Crawfordsville,Ind.	M8 ...146
Donora,Pa.	A7 141
Duluth,Minn.	A7 141
Fairfield,Ala.	T2 141
Houston,Tex.	S5 149
Johnstown,Pa	B2 141
Joliet,Ill.	A7 141
KansasCity,Mo.	S5 153
Kokomo,Ind.	C16 143
Minnequa,Colo.	C10 147
Monessen,Pa.	P7 146
Pittsburg,Calif.	C11 161
Portsmouth,O.(18)	P12 ..148
Rankin,Pa.	A7 141
So.Chicago,Ill.	R2 137
So.SanFran.,Calif.	C10 ..161
SparrowsPoint,Md.	B2 ..143
Sterling,Ill.(1)	N15 141

BALE TIES, Single Loop	Col.
AlabamaCity,Ala.	R2 ...123
Atlanta	A11 126
Bartonville,Ill.(19)	K4 ...123
Crawfordsville,Ind.	M8 ..132
Donora,Pa.	A7 123
Duluth,Minn.	A7 123
Fairfield,Ala.	T2 123
Joliet,Ill.	A7 123
KansasCity,Mo.	S5 135
Kokomo,Ind.	C16 125
Minnequa,Colo.	C10 128
Pittsburg,Calif.	C11 147
So.Chicago,Ill.	R2 123
So.SanFran.,Calif.	C10 ..147
SparrowsPoint,Md.	B2...125
Sterling,Ill.(1)	N15 123

WIRE, Upholstery Spring

Aliquippa,Pa.	J5 .....5.90
Alton,Ill.	L1 .....6.10
Buffalo	W12 .....5.90
Cleveland	A7 .....5.90
Donora,Pa.	A7 .....5.90
Duluth,Minn.	A7 .....5.90
Johnstown,Pa.	B2 .....5.90
LosAngeles	B3 .....6.85
Monessen,Pa.	P7, P16 ..5.90
NewHaven,Conn.	A7 ....6.20
Palmer,Mass.	W12 .....6.20
Pittsburg,Calif.	C11 ....6.85
Portsmouth,O.	P12 .....5.90
Roebling,N.J.	R5 .....6.20
So.Chicago,Ill.	R2 .....5.90
So.SanFrancisco	C10 ...6.85
SparrowsPoint,Md.	B2 ..6.00
Torrance,Calif.	C11 ....6.85
Trenton,N.J.	A7 .....6.20
Waukegan,Ill.	A7 .....5.90
Worcester,Mass.	A7 .....6.20

WOVEN FENCE, 9-15½Ga.

	Col.
AlabamaCity,Ala.	R2 ...127
Ala.City,Ala.,17-18ga.	R2 214
Aliquippa,Pa.9-14½ga.	J5 131
Atlanta	A11 134
Bartonville,Ill.(19)	K4 ...131
Crawfordsville,Ind.	M8 ..133
Donora,Pa.	A7 131
Duluth,Minn.	A7 131
Fairfield,Ala.	T2 131
Houston,Tex.	S5 139
Johnstown,Pa.	B2 131
Johnstown,17ga.,6"	B2...205
Johnstown,17ga.,4"	B2...208
Joliet,Ill.	A7 131
KansasCity,Mo.	S5 143
Kokomo,Ind.	C16 133
Minnequa,Colo.	C10 139
Monessen,Pa.	P7 136
Pittsburg,Calif.	C11 154
Portsmouth,O.(18)	P12 ..138
Rankin,Pa.	A7 131
So.Chicago,Ill.	R2 127
Sterling,Ill.(1)	N15 131

FENCE POSTS

ChicagoHts.,Ill.	C2 140
Duluth,Minn.	A7 125
Franklin,Pa.	F5 140
Huntington,W.Va.	W7 ..140
Johnstown,Pa.	B2 140
Marion,O.	P11 140
Minnequa,Colo.	C10 130
Moline,Ill.	R2 136
So.Chicago,Ill.	R2 140
Tonawanda,N.Y.	B12 140
Williamsport,Pa.	S19 ...150

TRACK BOLTS (20) Treated

KansasCity,Mo.	S5 ....9.85
Lebanon,Pa.(31)	B2 ....9.85
Minnequa,Colo.	C10 ....9.85
Pittsburgh	O3, P14 ....9.85
Seattle	B3 .....10.35

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala.	R2 118
Aliquippa,Pa.(13)	J5 118
Atlanta	A11 121
Bartonville,Ill.(19)	K4 ..118
Chicago,Ill.	W13 118
Cleveland	A9 125
Crawfordsville,Ind.	M8 ..122
Donora,Pa.	A7 118
Duluth,Minn.	A7 118
Fairfield,Ala.	T2 118
Galveston,Tex.	D7 126
Houston,Tex.	S5 126
Johnstown,Pa.	B2 118
Joliet,Ill.	A7 118
KansasCity,Mo.	S5 130
Kokomo,Ind.	C16 120
Minnequa,Colo.	C10 123
Monessen,Pa.	P7 124
Pittsburg,Calif.	C11 137
Portsmouth,O.	P12 124
Rankin,Pa.	A7 118
So.Chicago,Ill.	R2 118
SparrowsPoint,Md.	B2...120
Sterling,Ill.(1)	N15 118
Torrance,Calif.	C11 138
Worcester,Mass.	A7 124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa.	A3 ..$7.35
Wheeling,W.Va.	W10 ...7.35

TIE PLATES

Fairfield,Ala.	T2 .....4.50
Gary,Ind.	U5 .....4.50
Ind.Harbor,Ind.	I-2 ....4.50
Lackawanna,N.Y.	B2 ..4.50
Minnequa,Colo.	C10 ....4.50
Pittsburg,Calif.	C11 ....4.65
Seattle	B3 .....4.65
Steelton,Pa.	B2 .....4.50
Torrance,Calif.	C11 ....4.65

JOINT BARS

Bessemer,Pa.	U5 .....4.70
Fairfield,Ala.	T2 .....4.70
Ind.Harbor,Ind.	I-2 ....4.70
Joliet,Ill.	U5 .....4.70
Lackawanna,N.Y.	B2 ..4.70
Minnequa,Colo.	C10 ....4.70
Steelton,Pa.	B2 .....4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind.	I-2, Y1..6.15
KansasCity,Mo.	S5 .....6.40
Lebanon,Pa.	B2 .....6.15
Minnequa,Colo.	C10 ....6.15
Pittsburgh	J5 .....6.15
Seattle	B3 .....6.65
So.Chicago,Ill.	R2 .....6.15
Struthers,O.	Y1 .....6.15
Youngstown	R2 .....6.15

AXLES

Ind.Harbor,Ind.	S13 ....5.60
Johnstown,Pa.	B2 .....5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa.	U5	3.60	3.50	3.55	4.00
Ensley,Ala.	T2	3.60	3.50	...	4.00
Fairfield,Ala.	T2	...	...	...	4.00
Gary,Ind.	U5	3.60	3.50	3.55	...
Huntington,W.Va.	W7	...	...	...	5.00
Ind.Harbor,Ind.	I-2	3.60	3.50	3.55	...
Johnstown,Pa.	B2	...	...	...(16)	4.00
Lackawanna,N.Y.	B2	3.60	3.50	...	4.00
Minnequa,Colo.	C10	3.60	3.50	...	4.50
Steelton,Pa.	B2	3.60	3.50	...	...
Williamsport,Pa.	S19	...	...	...	4.75

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.650
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025

W	Cr	V	Mo	
6.4	4.5	19.5	5	0.96-0.965
1.5	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel products include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035": 0.035" and heavier, 0.35c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sioss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel

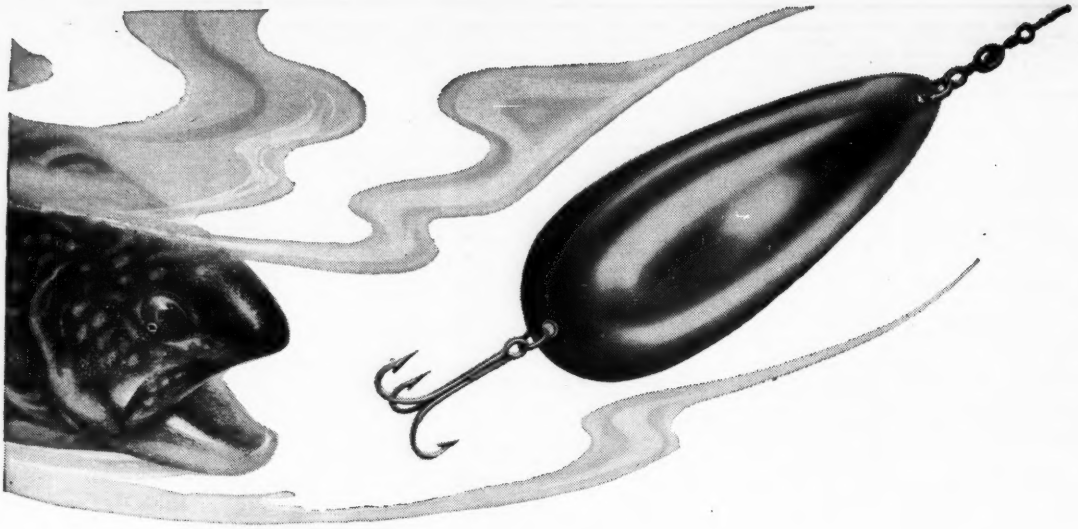
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

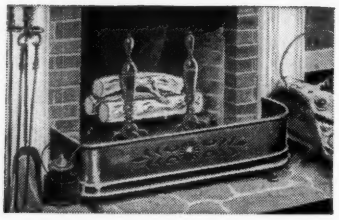


What's the big attraction?

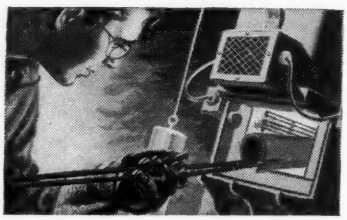
The same brilliance that catches Mr. Trout's eye is also found on a wide range of brass and copper products, from costume jewelry to the gleaming brightwork on a ship.

The clean, bright surface of Chase metals doesn't just happen . . . it is controlled in research laboratories by Chase metallurgists . . . it is checked and tested every step along the way to the finished sheet, rod, wire or tube.

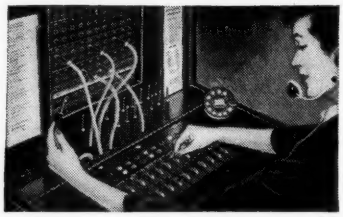
Chase brass and copper products are available, subject to government controls, through dealers, and jobbers across the nation and through Chase's 23 convenient mill warehouses.* Chase Brass & Copper Co., Incorporated, Waterbury 20, Conn.



Chase brass and other copper alloys range in color from rich red to bright yellow. The right color for each product and use is one of the features of Chase research and quality control.



When the Chase Technical Advisory Service is asked to solve a problem by a manufacturer, Chase metallurgists will often find the right answer in this research laboratory test furnace.



Patented Chase Telnic® Bronze makes better switchboard parts. Chase research developed Telnic for high strength, excellent machinability, corrosion resistance, and conductivity.

Chase The Nation's Headquarters for BRASS & COPPER

Chase Brass & Copper Co. is a subsidiary of KENNECOTT COPPER CORPORATION

*Albany† Atlanta Baltimore Boston Chicago Cincinnati Cleveland Dallas Denver† Detroit Houston† Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York Philadelphia Pittsburgh Providence Rochester† St. Louis San Francisco Seattle Waterbury (†Sales Office Only)

STANDARD PIPE, T & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	6.0	0.57	23.5	21.5	...	+10.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.78	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½% on 3½", 4"; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜"; Wheatland, Pa. W9, 2 points lower on ⅛", ¼", ⅜". Following make ½" and larger: Lorain, O. N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6, ¼-⅜"; Benwood, W. Va. W10, except plus 4% on ⅛", plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3"; Wheatland, Pa. W9, add 2 points on ¼", ⅛", ⅜", 1 point lower on ¾" 2 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½% on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6-in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1⅝	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2¾	12	29.65	36.32	29.57	34.76
3	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Strip Plates Carbon Base 10%	Strip Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302 ...	....	....	....	19.75	26.24–27.50	77.00
304 ...	25.00	29.50	....	24.50	27.50–27.77	77.00
309 ...	30.50	35.00	....	....	....	....
310 ...	36.50	41.00	....	....	....	144.00
316 ...	29.50	34.00	....	26.00	35.92–36.50	....
317 ...	34.50	39.00	....	....	....	....
318 ...	33.50	38.00	....	....	....	....
321 ...	26.50	31.00–32.00	....	23.00	33.00	111.00
347 ...	27.50	32.00	....	24.00	33.50–33.83	130.00
405 ...	21.25	27.75	....	....	....	....
410 ...	20.75	27.25	....	....	....	....
Nickel.	33.55	45.15	41.00	54.00	....	....
Inconel.	41.23	54.18	....	....	....	165.00
Monel..	34.93	46.28	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....

* Deoxidized, † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ¾-in. 18.5
- ⅞-in. and larger ... 17.5

Longer than 6 in.:
- All diams. 14

Lag bolts, all diams.:
- 6 in and shorter ... 23
- over 6 in. long 21

Ribbed Necked Carriage 18.5
Blank 34
Plow 34
Step, Elevator, Tap and Sleigh Shoe 21
Tire bolts 12
Boiler & Fitting-Up Bolts 31

NUTS

H.P. & C.P. Square:	Reg. Hvy.
½-in. & smaller	15 15
⅝-in. & ¾-in./	12 6.5
⅞-in.-1½-in. ..	9 1
1⅝-in. & larger	7.5 1
H.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ¾-in. .	16.5 6.5
⅞-in.-1½-in. ..	12 2
1⅝-in. & larger	8.5 2
C.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ¾-in. .	23 17.5
⅞-in. & 1½-in.	19.5 12
1⅝-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg. Hvy.
½-in. & smaller..	35 28.5
⅝-in. & ¾-in. ..	29.5 22
⅞-in.-1½-in.	24 15
1⅝-in. & larger..	13 8.5
	Light
⅞-in. & smaller	35
1"-in. to ⅝-in.	28.5
¾-in. to 1½-in.	26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....48 & 10
Plated finishes .....31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged: per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 42
- ¾-in. through 1 in. . 34

Longer than 6 in.:
- ⅝-in. & smaller 26
- ¾-in. through 1 in. . 4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller ... 35
¼-in. diam. & larger .. 16
N.F. thread, all diams. 10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c
⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers—List to list-plus-$1

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	36.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	48.25	37.00
347...	53.75	52.25	41.50
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Balt., Types 301-347 sheet, except 303 and 309 E2.

Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg...26.00-33.00
Industrial xylol ..25.00-33.50

Per ton bulk ovens
Sulphate of ammonia..$32-$45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) ...17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron: Cents
- 98+% Fe, annealed. 18.00
- Unannealed 14.50
- Swedish, c.l.f. New York, in bags..8.35-9.95

Electrolytic iron:
- Annealed, 99.5% Fe. 42.50
- Unannealed (99 + % Fe) 36.50
- Unannealed, 99 + % Fe (minus 325 mesh) 53.50

Powder Flakes 48.50

Carbonyl Iron:
- 97.9-99.8% size 5 to 10 microns ..83.00-148.00

Aluminum:
- Carlots, freight allowed 29.50
- Atomized, 500 lb drums, freight allowed 32.50

Antimony, 500 lb lots. 71.00
Brass, 20-ton lots.28.25-32.00
Bronze, 10-ton lots 51.25-60.00
Phosphor - Copper, 20-ton lots 50.00

Copper:
- Electrolytic 37.25
- Reduced 34.75

Lead 22.50
Magnesium 75.00-85.00

Manganese:
- Minus 100 mesh 57.00
- Minus 35 mesh 52.00
- Minus 200 mesh 62.00

Nickel unannealed 86.00
Nickel-Silver 5-ton lots 44.50
Silicon 38.50
Solder (plus cost of metal) 8.50
Stainless Steel, 302 ... 83.00
Zinc, 10-ton lots..20.00-28.00

Tungsten Dollars

Melting grade, 99% 60 to 200 mesh:
- 1000 lb and over ... 5.85
- Less than 1000 lb .. 6.00

Molybdenum:
- 99.9%, minus 200 mesh 3.24

Chromium, electrolytic 99% Cr min. 3.50

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvll.fur. .$14.50-15.00
Connellsvll.fdy. ..16.50-17.50
New River foundry... 21.30
Wise county, foundry.. 15.95
Wise county, furnace.. 15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens.$22.75
Everett, Mass., ovens
- New England, del..*24.80

Chicago ovens 23.00
- Chicago, del. 24.50

Terre Haute, ovens.... 22.50
Milwaukee, ovens 23.75
Indianapolis, ovens ... 22.75
- Chicago, del. 26.62
- Cincinnati, del. 25.85
- Detroit, del. 26.85

Ironton, O., ovens 22.50
- Cincinnati, del. 25.12

Painesville, O., ovens. 24.00
- Cleveland, del. 25.82

Erie, Pa., ovens 23.50
Birmingham, ovens .. 20.30
- Cincinnati, del. 25.23

Philadelphia, ovens ... 22.70
Neville Island, Pa., ovens 23.00
Swedeland, Pa., ovens. 22.60
St. Louis, ovens
- St. Louis, del. 25.40

Portsmouth, O., ovens 23.50
- Cincinnati, del. 25.12

Detroit, ovens 24.00
- Detroit, del. 25.00
- Buffalo, del. 26.89
- Flint, del. 26.59
- Pontiac, del. 25.47
- Saginaw, del. 26.92

* Or within $4.55 freight zone from works.

Advertisement

ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

How CHROMIUM BRIQUETS Increase Hardness and Strength of Cast Iron

Chromium briquets are made especially for the addition of chromium to cast iron in the cupola. The amount added may vary from small percentages up to as high as 15 per cent.

Function of Chromium in Cast Iron

Chromium is added to cast iron for the purpose of refining the grain and stabilizing the combined carbon content, thus increasing strength, hardness, and resistance to wear and abrasion. Even very small additions of chromium have a decided effect, and as little as 0.25 to 0.50 per cent will yield a great improvement in iron used for resistance to wear. A typical application is in automotive cylinder castings, particularly in heavy-duty truck and tractor work.

The stabilizing and refining effect of chromium is particularly useful to foundrymen producing castings of medium to heavy section. The slow cooling of such castings often results in weak, open-grained iron. Chromium in amounts up to 1.00 per cent will increase the stability of the structure of the castings and help to offset the effect of slow cooling in the mold.

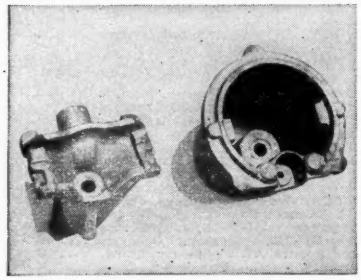


Fig. 1—These low-chromium iron castings, which are parts for a die-casting machine, are machinable, uniformly hard, and resistant to the effect of high temperature.

High-Temperature Service

The strong effect of chromium in stabilizing the structure of gray iron has made its use in iron subjected to high temperatures almost universal. Chromium in the range of 0.75 to 1.25 per cent greatly reduces the growth and warping that occur in unalloyed irons as the result of repeated heating and cooling. Chromium cast irons in this range of chromium content may be inoculated with silicon alloys to decrease the tendency to chill and, also, to assist in maintaining machinability. Such irons are adaptable to various high-temperature applications, such as melting pots, die-casting machine parts, grate bars, etc.

How Binder Protects Chromium

For the addition of chromium to cast iron, ELECTROMET produces briquets containing exactly 2 lb. of chromium each. The alloy is protected by a refractory binder, which has a high melting point and, therefore, helps to prevent oxidation of the chromium until it is melted and delivered to the crucible of the cupola.

The recovery of chromium from "EM" briquets is thus uniformly high, normally above 85 per cent, and it is easy to obtain the desired final chromium content. This is of particular importance when the limitations of hardness and machinability for a casting demand close chemical control.

Typical Briquet-Iron Mixture

The use of "EM" chromium briquets in the production of cast iron of low chromium content is shown in the table below.

Fig. 2—"EM" chromium briquets are hexagonal in shape, and each contains exactly 2 lb. of chromium. Notched briquets (right), which are easy to break in half, can be purchased for use when 1 lb. additions of chromium are desired.

The mixture given is for a medium-strength iron used for castings in which resistance to wear or heat is required.

Booklet Available

Typical briquet mixtures for other types of irons are given in the booklet "Briquetted Alloys for the Iron Foundry Industry." This booklet also contains information about "EM" briquets of silicon, silicomanganese, and ferromanganese. If you would like a copy, free of charge, simply write to the address given above or to the ELECTROMET office nearest to you. Offices are in Birmingham, Chicago, Cleveland, Detroit, Los Angeles, New York and San Francisco. In Canada: Welland, Ontario.

The terms "EM" and "Electromet" are registered trade-marks of Union Carbide and Carbon Corporation.

Typical Briquet Mixture for Low-Chromium Iron

Base Charge			Alloys in Charge Material					
			Silicon		Manganese		Chromium	
Per Cent	Lb.	Material Charged	Per Cent	Lb.	Per Cent	Lb.	Per Cent	Lb.
20.0	200	Pig Iron	2.25	4.50	0.85	1.70	—	—
30.0	300	Return Scrap	2.00	6.00	0.75	2.25	0.57	1.71
30.0	300	Purchased Scrap	2.00	6.00	0.65	1.95	—	—
20.0	200	Steel Scrap	0.10	0.20	0.45	0.90	—	—
100.0%	1,000 lb.	Total Base Charge		16.70 lb.		6.80 lb.		1.71 lb.
Briquets Required		5 Silicon Briquets		5.00		—		—
		1 Silicomanganese		0.50		2.00		—
		2½ Chromium Briquets		—		—		5.00
		Total Alloys Charged		22.20 lb. Si or 2.22% Si		8.80 lb. Mn or 0.88% Mn		6.71 lb. Cr or 0.67% Cr
		Melting Recovery		x .90		x .85		x .85
		Final Iron Analysis		2.00% Si		0.75% Mn		0.57% Cr

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140[5]		Carbon	Floor
New York (city)	6.28	7.24	8.42	6.50	...	6.52	7.33	9.29	6.38	6.76	8.01
JerseyCity(c'try)	6.09	6.94	8.12	6.36	...	6.22	7.03	8.99	6.08	6.46	7.71
Boston (city) ..	6.40	7.20	8.51	6.32	...	6.25	7.12	10.80	6.40	6.60	7.84
Boston (c'try)..	6.20	7.00	8.31	6.12	...	6.05	6.92	10.60	6.20	6.40	7.64
Phila. (city) ...	6.09	7.05	8.25	6.29	7.19	6.35	7.19	10.50	6.11	6.38	7.33
Phila. (c'try) ..	5.84	6.80	8.00	6.04	6.94	6.10	6.94	10.25	5.86	6.13	7.08
Balt. (city) ...	5.74	7.04	8.40	6.27	...	6.25	6.87	...	6.37	6.33	7.61
Balt. (c'try) ..	5.54	6.84	8.20	6.07	...	6.05	6.67	...	6.17	6.13	7.41
Norfolk, Va. ...	6.78	...	...	...	...	6.04	7.30	...	6.30	6.30	7.15
Richmond, Va. .	5.74	6.57	8.38	6.14	...	5.91	6.59	...	6.72	6.86	8.00
Wash. (w'hse) .	6.05	7.26	8.49	6.50	...	6.50	7.26	...	6.60	6.65	7.86
Buffalo (del.)..	5.74	6.52	8.31	6.06	...	5.72	6.65	10.72††	6.02	6.18	7.55
Buffalo (w'hse).	5.54	6.32	8.11	5.86	...	5.52	6.45	10.52††	5.82	5.98	7.35
Pitts. (w'hse)..	5.54	6.32	8.15	5.84	6.90	5.47	6.40	10.10††	5.65	5.70	6.89
Detroit (w'hse).	5.74	6.49	8.34	5.78	7.15	5.76	6.60	10.37††	6.12	6.17	7.23
Cleveland (del.)	5.74	6.52	8.01	5.85	7.14	5.81	6.60	10.41††	6.18	6.02	7.43
Cleve. (w'hse) .	5.54	6.32	7.81	5.65	6.94	5.61	6.40	10.21††	5.98	5.82	7.23
Cincin. (w'hse).	5.87	6.39	8.17	5.79	...	5.77	6.66	10.52††	6.12	6.17	7.31
Chicago (city)..	5.74	6.52	7.90	5.69	...	5.67	6.50	10.30††	5.85	5.90	7.09
Chicago (w'hse)	5.54	6.32	7.70	5.49	...	5.47	6.30	10.10††	5.65	5.70	6.89
Milwau. (city) .	5.91	...	8.07	5.86	...	5.84	6.71	10.37††	6.02	6.07	7.26
Milwau. (c'try).	5.71	...	7.87	5.66	...	5.64	6.51	10.17††	5.82	5.87	7.06
St. Louis (del.)	6.04	6.82	8.20	5.99	...	5.97	6.90	10.60††	6.25	6.30	7.49
St. L. (w'hse) .	5.84	6.62	8.00	5.79	...	5.77	6.70	10.40††	6.05	6.10	7.29
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans.Cty(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.23
Birm'hm(w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city).	6.50	8.30[3]	9.50	6.60	10.65	6.45	8.35	11.50††	6.50	6.50	8.75
L. A. (w'hse)..	6.30	8.10[3]	9.30	6.40	10.45	6.25	8.15	11.30††	6.30	6.30	8.55
Seattle-Tacoma.	7.01	8.64	9.50	7.95	...	6.70	9.13	10.35	6.52	6.91	8.73
SanFran.(w'hse)	6.44	7.88[3]	9.10[3]	6.42	...	6.32	8.20	11.30	6.30	6.43	8.50

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 16 gage; †† as annealed; §§ 15 gage. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

(1951 contract prices; 1952 prices not established)

Gross ton, 51½% (natural), lower lake ports. After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 65%:	
Spot	nom.
Long-term contract	20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	30.00-31.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 25:1 lump	nom.
Rhodesian	
45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $186, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244, f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lots 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 34c per lb of metal; packed, 34.75c; ton lot 36.25c; less ton lots 38.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 40,000 lb or more, 28c; 2000 to 39,999 lb, 30c; 250 to 1999 lb, 32c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65 - 68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lots 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, Add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton lot 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal. Fe) Lump, carload bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14, in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

NOTE: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 125, June 30 issue; calcium zirconium and briquetted alloys, page 153, June 23. Refractories prices also were published on page 153, June 23 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

July 3	$42.33
June 26	41.50
June, 1952	42.63
July, 1951	44.00
July, 1947	37.23

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings.	—10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00

Cut Structurals & Plate:

16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base

Foundry, Steel:

20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than matherial suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or/steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross tons which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory:	
Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

* F.O.B. shipping point.

OPEN MARKET

Birmingham

(Delivered)

No. 1 cupola cast	$42.00
Stove plate	37.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston

(F.o.b. shipping point)

No. 1 cupola cast	32.00
Heavy breakable	30.00
Stove plate	30.00
Unstripped motor blocks	28.00

Buffalo

(Delivered)

No. 1 heavy melting	37.00*
No. 2 heavy melting	37.00*
No. 1 Bundles	38.00*
No. 1 busheling	38.00*
No. 2 bundles	37.00*
Machine shop turnings.	27.00*
Mixed borings, turnings	31.00*
Cast iron borings.	31.00*
Short shoveling turnings	31.00*
No. 1 cupola cast	41.00-42.00*
No. 1 machinery cast	42.00-43.0*

* Nominal.

Chicago

(Delivered)

No. 2 heavy melting	38.50
No. 2 bundles	38.50
Machine shop turnings.	26.00-27.00
Mixed borings, turnings	31.00-32.00
Shoveling turnings	31.00-32.00
Cast iron borings	31.00-32.00
No. 1 cupola cast	43.00-47.00
Charging box cast	39.00-41.00
Heavy breakable	36.00-38.00
Burnt cast	36.00-38.00
Cast iron brake shoes.	40.00-41.00
Stove plate	36.00-41.00
Clean auto cast	43.00-45.00
Unstripped motor blocks	33.00-35.00
Malleable	48.00-50.00
Drop broken machinery	45.00-50.00

Cleveland

(Delivered)

No. 1 cupola cast	44.00

Detroit

(Brokers' buying prices; f.o.b. shipping point)

Machine shop turnings.	24.00-25.00
No. 1 cupola cast	43.00-44.00
Heavy breakable	39.00
Clean auto cast	46.00-47.00
Unstripped motor blocks	36.00-37.00
Drop broken machinery.	46.00-47.00
Stove plate	42.00-43.00
Charging box cast	43.00

New York

(Brokers' buying prices; delivered consumers' plants)

Cupola cast	38.00
Unstripped motor blocks	34.00

Philadelphia

(Delivered)

No. 1 heavy melting	40.00-41.00
No. 2 heavy melting	38.00
No. 1 bundles	40.00-41.00
No. 2 bundles	38.00
No. 1 busheling	41.00
Mixed borings, turnings	30.00
Machine shop turnings.	28.00
Short shoveling turnings	30.00
No. 1 cupola cast	36.00-38.00
Unstripped motor blocks	35.00
Heavy breakable	38.50-39.50
Machinery cast	44.00-45.00

Pittsburgh

(Delivered)

No. 1 cupola cast	46.00
Heavy breakable	45.00

San Francisco

(Delivered)

No. 2 bundles	30.00
No. 1 cupola cast	42.00

Seattle

(F.o.b. shipping point)

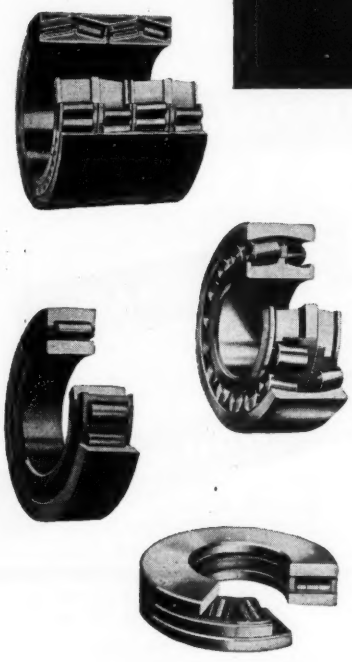
No. 2 bundles	29.00
No. 1 cupola cast	39.00-40.00
Heavy breakable	35.00-40.00

St. Louis

(Delivered)

No. 1 cupola	41.00
Stove plate	39.00
Unstripped motor blocks	35.00

pulling together...



Working closely with makers and users of all kinds of equipment—from small appliances to giant rolling mills—Torrington engineers have helped solve countless problems involving bearing design, installation and maintenance. They have had many years of experience in the manufacture and application of *all* types of anti-friction bearings.

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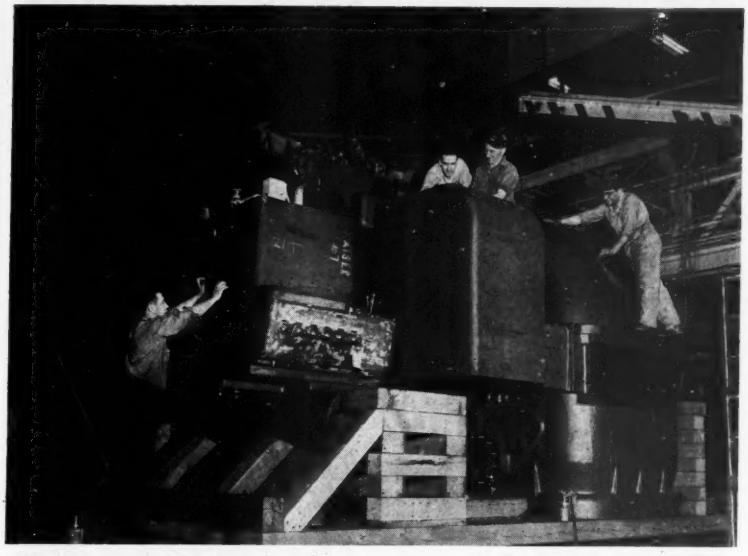
The Metal Market



Aluminum Production Booster

The fifth of fourteen 12,000-kw steam turbine-generator sets for Kaiser Aluminum & Chemical Corp.'s Chalmette, La., reduction plant is readied for shipment from the General Electric Co.'s Medium Steam Turbine, Generator & Gear Department, Lynn, Mass. GE is building $13 million worth of equipment to be used in facilities to boost Kaiser's output by about 400 million pounds a year

You'll find it easier to buy and stock copper and aluminum —but they'll cost you more. With prices rising and strikes threatening it may pay you to buy soon and heavily

EMERGENCY ACTIONS in Washington will allow more leniency in buying and stocking copper and aluminum in the next few months—if they're available.

Here's what the latest government measures mean: You'll be able to get all the copper and brass mill products you're entitled to, but you'll pay more for them. You can build up extra-size inventories of copper and aluminum while the steel jam is on. And, if you take the cue, you'll buy soon and heavily.

On the Surface—Many beefed-up orders for copper will go out because of the NPA green light. Industry, remembering last August's copper strike, wants to squirrel away metal to last through another one that's shaping up (p. 62).

Most everyone wants to take his full quarterly ration of domestic copper and with quick delivery, even if he's presently strikebound. Strike threats aren't the only reason. Domestic prices, now well under the free world price, will be forced up by any wage increase. NPA is also trying to encourage buying abroad; it wants to get Chilean copper into the country in volume and with speed to protect the national stockpile from further depletion if UMMSW walks out.

Lid Lifted—Inventory limits on aluminum (45 days) and copper (60 days) can be ignored temporarily, says NPA.

Built-up stocks of aluminum and copper can't be grounds for prying out extra allotments though.

Money Matters—OPS finally came through with amendments to copper wire mill and brass mill price schedules, effective July 1. Some companies had price schedules ready; others had to wait till the release date to learn what to include before posting new price lists.

Brass mills, wire mills and foundries generally raised their prices the fullest extent permitted. The brass industry is allowed an addition of 3.84 cents per pound of copper content, but has to deduct 2 cents for every pound of contained zinc. All copper products went up 3.84 cents a pound. Free cutting brass was allowed a 1.22-cent boost, computations allow for about 20 per cent copper scrap content. Other increases: Yellow brass 1.89 cents, low brass 2.67, red brass products 2.96, commercial bronzes 3.26, naval brass products 1.52, 5 per cent phosphor bronze 3.55.

Scrap Factor — Wire and cable prices reflect OPS allowance for 10 per cent copper lost as scrap during manufacture, which brings the increase factor to 4.25 cents per pound copper content. The increase is 3.25 for copper weatherproof wire and cable sold by the pound.

On an l.c.l. basis, bare copper wire now brings 33.42 cents a pound. Weatherproof wire is quoted at 34.35 cents and magnet wire commands 39.50 cents. Shipments of intermediate products to redrawers or insulators are made on the basis of the delivered valley cost of the electrolytic wire bars.

Hold Fire!

Offshoots of the aluminum from Canada proposal: DPA was warned by the "watchdog" committee on defense production not to go ahead with any plans while Congress recesses. The committee favors expansion at home, but feels that helping one of the big three or any copper companies interested in the government offer would be supporting a so-called oligoply.

Nonferrous Briefs

Added to the rash of strikes on hand or possible is one in nickel, in the Sudbury district of Ontario. . . Aluminum price in Britain was raised for the third time this year. . . Galvanizers are readying big orders for the steel strike's end . . . Quicksilver prices are being slashed abroad.

STEEL'S Metal Price Averages for June, 1952

(Cents per pound)

Electrolytic Copper, del. Conn.	24.500
Lead, St. Louis	15.060
Prime Western Zinc, E. St. Louis	15.740
Straits Tin, New York	121.50
Primary Aluminum Ingots, del.	19.000
Antimony, f.o.b. Laredo, Tex.	39.000
Nickel, f.o.b. refinery	56.500
Silver, New York	82.750

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 15.00c; brass special 15.25c; intermediate 15.50c, East St. Louis; high grade 16.35c, delivered.

Lead: Common 15.80c; chemical 15.90c; corroding 15.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4,18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 39.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 39.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $195-$198 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.25 del.; special or patented shapes $2.40.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 82.75c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze 95%, 41.30; 90% 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85%, 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective July 1, 1952)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 32.795; 30,000 lb lots, 32.92; l.c.l., 33.42, Weatherproof, 100,000 lb, 30.60; 30,000 lb, 33.85; l.c.l., 34.35. Magnet wire del., 15,000 lb or more,, 38.75; l.c.l., 39.50.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4 17S-T4	R-317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.0188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) **Sheets:** Full rolls, 140 sq ft or more $21.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. **Pipe:** Full coils $21.00 per cwt. Traps and bends: List prices plus 50%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 21.25c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 22.50c; over 12-in., 22.50-23.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83 00c. Rods and shapes, 73.00c. Plates, 75 00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63 50c. Rods and shapes, 58.50c. Plates, 59 50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 28.00c; 5 tons and over 28.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb, 75.50c; 3000 to 10,000 lb, 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Choride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10,00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 12.00-12.25; battery plates 7.00-7.50; linotype and stereotype 13.50-14.00; electrotype 12.00-12.50; mixed babbitt 14.50-14.75.

SMELTERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Zinc: Old zinc, 8.75; new die cast scrap, 8.50; old die cast scrap, 8.50.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July 1-2	24.50	15.80	15.00	121.50	19.00	39.00	56.50	82.75
June 24-30	24.50	15.80	15.00	121.50	19.00	39.00	56.50	82.75
June 23	24.50	15.30	15.00	121.50	19.00	39.00	56.50	82.75
June 18-21	24.50	14.80	15.00	121.50	19.00	39.00	56.50	82.75
June 5-17	24.50	14.80	16.00	121.50	19.00	39.00	56.50	82.75
June 2-4	24.50	14.80	17.50	121.50	19.00	39.00	56.50	82.75
June Avg.	24.50	15.06	15.74	121.50	19.00	39.00	56.50	82.75
May Avg.	24.50	15.519	19.50	121.50	19.00	42.077	56.50	85.356
Apr. Avg.	24.50	18.723	19.50	121.50	19.00	49.077	56.50	88.00
Mar. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Tool Steel . . .

Tool Steel Prices, Page 159

Pittsburgh—Tool steel producers in this area generally are operating and are not being directly affected by the steel strike. An indirect effect that will make itself felt shortly is the holding up of tool steel shipments to customers. As manufacturers are forced to close for lack of steel, they will have tool steel shipments held up until their operations are resumed. Buying activity from government sources has picked up in the last month but this is at least partly traceable to government agencies using up their appropriations before end of the fiscal year. Tool steels are in a buyers' market, with a slowdown in consumer lines balancing whatever pickup resulted from defense and defense support activities.

Semifinished Steel . . .

Semifinished Prices, Page 157

Detroit—With settlement of McLouth Steel's strike 49 per cent of the area's basic steelmaking capacity is in operation. Only still-struck basic steel producer in the district is Great Lakes Steel.

Sheets, Strip . . .

Sheet and Strip Prices, Page 157 & 158

Cleveland—Loss of tonnage in the steel strike will tighten supply noticeably in the closing months of the year. Whereas distribution controls had been expected to be lifted before yearend it now is doubtful such action will be taken before 1953. Carryover into third quarter is heavy because of the strike-lost tonnage in June. As a result it is expected fourth quarter will be virtually blanked out so far as new business is concerned to care for the overflow from third quarter. However, sheetmakers have not opened books for the fourth period and under the latest government regulation do not have to do so until 15 days after the steel strike is ended.

Boston—Cold-rolled strip mills are down in most cases, or will be during this month. Vacations are coming with inventories of hot-rolled steel depleted making uncertain the rate of operations when production is resumed. Numerous consumers of flat-rolled are suspending. What is left of stocks will be stretched out, but replacements from mills during third quarter will be under requirements.

New York—While various sheet fabricators are down for vacations, there is nevertheless a quickening interest in steel supply. Shops find stocks are becoming increasingly unbalanced and with producers well behind on commitments due to the steel strike, problems lie ahead in obtaining sufficient tonnage to sustain operations. Certain large consumers believe it will be anywhere from two to three weeks after the strike is ended before they will be able to obtain mill shipments on anything like a normal basis.

Pittsburgh — Although consumers generally are severely pinched for sheets, there isn't any pressure being brought to bear on producers. There will be little opportunity for the placing of new orders in fourth quarter except in products that were relatively easy before the steel strike. A soft condition in electrical sheets used in appliance fractional horsepower motors probably will continue throughout the remainder of this year.

Steel Bars . . .

Bar Prices, Page 157

New York — Bar producers will have little new tonnage available for fourth quarter. They were solidly booked up for third quarter before the strike began and because of the strike they find themselves with a heavy carryover from second quarter. At end of that period some producers had arrearages of at least six weeks, due mainly to the walkout but to some extent to overbooking. By the time the mills will be able to resume on a normal basis, it is believed practically the entire fourth quarter will have to be blanked out, certainly all but a couple of weeks or so at best.

Boston—Lack of hot-rolled bars has forced all but one cold finishing plant to close. Compressed Steel Shafting Co., Readville, Mass., still is operating, but it is getting low on bars. Volume of bars shipped against designated high symbols for military requirements is not impressive.

Philadelphia—Some carbon bar producers claim their arrearages are likely to be so heavy by the time the strike is over, even assuming fairly early settlement, they will have little capacity available for new tonnage in fourth quarter.

Cleveland—Unless substantial tonnage of third quarter orders on bar mill books is canceled, little new tonnage is likely to be entered for fourth quarter. Expectations are most of the period may have to be blanked out to accommodate the overflow from third quarter. The mills do not have to open fourth quarter books until 15 days after the strike ends, the original July 1 opening date being lifted because of the work stoppage. Opening of third quarter finds most mills still strike-bound. The carryover tonnage from second quarter will necessitate considerable revision in summer rolling schedules even though the steel strikers return to their jobs at once.

Plates . . .

Plate Prices, Page 157

Philadelphia — Strike-bound plate mills moved out tonnage which had been processed for high-rated defense work prior to the strike. Talk of resuming operations sufficiently to process defense orders has died down, partly because of the difficulty in resuming operations on such a small basis and partly because of the possibility of an early settlement of the industry-wide strike.

Boston — Plate fabricating shops, including tank builders, still have fair inventories of light plates. Vacations are serving to stretch out supplies. Users of heavy plates are not so well fixed, and in some cases are not getting the tonnage permitted under high defense ratings.

Tin Plate . . .

Tin Plate Prices, Page 158

Pittsburgh—Going into their busiest season canmakers have two to three weeks' inventories to support operations. Even this not too comfortable position is possible only because canmakers built up their inventories to higher levels than normal prior to the strike. Unless there is an early settlement food packers estimate losses because of a container shortage may reach 20 million cases of canned foods per week. It is rumored that the government may step in and allocate Weirton's output to minimize the loss in perishable foods. Even such action will provide little relief during the peak packing season.

Tubular Goods . . .

Tubular Goods Prices, Page 161

Pittsburgh—The jam-up in oil country goods will continue at least into first quarter next year. Some producers believe it will be necessary to blank out the entire fourth quarter for new orders as the carryover from third quarter based on present indications will leave little room for new tonnage on mill books. Indicative of the extent to which existing supplies are melting away is the Petroleum Administration's holdup on delivery of oil well drilling pipe from emergency wildcat field stocks.

Los Angeles— Oil well drilling activity is being curtailed by shortages of casing and small diameter pipe due to the steel strike. Major drillers are trimming drilling operations 20 per cent.

Structural Shapes . . .

Structural Shape Prices, Page 157

New York—May structural bookings amounted to 210,118 tons, practically the same as for the preceding month, according to the American Institute of Steel Construction. Revised figures for April were 209,231 tons. Total shipments for the first five months of this year amounted to 1,089,685 tons.

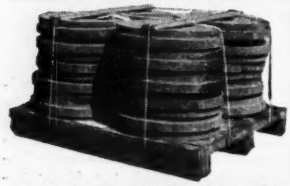
May shipments were 221,743 tons, increase of 5 per cent over April, during which 230,682 tons were moved on the basis of a revised estimate. Total shipments for the first five months amounted to 1,236,610 tons, against 1,113,306 tons in the corresponding period of last year.

Backlog as of May 31 amounted to 2,236,443 tons, against 2,771,264 a year ago.

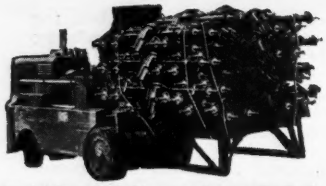
Plans are expected to be issued by the Port Authority of New York around July 10 for an additional roadway for the Lincoln tunnel between Manhattan and New Jersey. A substantial tonnage of cast iron segments will be required, although relatively little structural steel.

Boston — Some fabricators' drawing rooms are closed and work halted

What shape do you ship?



Flywheel castings (3200 lbs.) are safely palletized for easy, rapid transportation. (Photo courtesy International Harvester Company, Industrial Power Division.)



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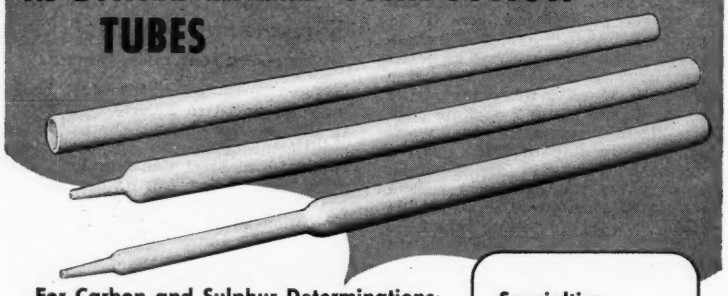

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on assemblies where only part of the steel for a project is available. New contracts approximte 5500 tons. American Bridge Division, U. S. Steel Co., Pittsburgh, will fabricate and erect a double-leaf bascule bridge, Chelsea river, Boston-Chelsea, 3700 tons, including counterweight. Unit bids on the steel were: for fixed spans, 29.45c per pound; carbon steel for movable span, 38.55c; silicon steel for movable span, 38.80c; cast iron counterweights, 700 tons, 15.80c.

Seattle—Fabricating plants in operation are facing early closing if mill operations are not resumed shortly. Largest plant here reports inventory will not carry more than 60 days.

Wire . . .

Wire Prices, Page 159

Boston—Wire volume shipped to consumers and converters, rods to the latter, covering higher-rated military symbols is small, less than 1000 tons from mills in this area. Johnson Steel & Wire Division, Pittsburgh Steel Co., has resumed operations, but output has declined with nonintegrated mills because of vacations and dwindling rod supply.

Pig Iron . . .

Pig Iron Prices, Page 156

Chicago—Here and there smaller gray iron foundries have exhausted their pig iron supplies but, for the most part shops continued to operate up to the July 4 holiday. Vacation closings for the next two weeks will be general and the period of suspension has possibility of being extended unless the steel strike ends and blast furnaces resume production. Without such resumption many foundries will not have sufficient iron to warrant reopening.

Boston—The Everett, Mass., blast furnace will stock more iron this month, having rebuilt shop inventories. Some consumers will take no iron in July. The melt is low and many foundries need business. Special freight rate from Buffalo to Worcester, Mass., makes delivered prices on all grades lower than at Boston by $1.05 per ton. The rate is $9.602 to Worcester compared with $10.649 to Boston.

New York—With many foundries down for mass vacations, and various furnaces strike-bound, the movement of pig iron is light. Few foundries have arranged to take in iron during vacation suspensions.

Philadelphia—Pig iron is moving slowly because of the steel strike and the fact that many foundries are down for mass vacations.

Pittsburgh—Many foundries in the district are down for mass vacations, providing temporary relief from their worries about how to sustain operations. There are no announcements as yet indicating that shutdowns may be longer than the vacation period. Most shops plan to reopen and operate for awhile at least following vacations.

Cleveland—Pressure for merchant pig iron will ease noticeably over the next couple weeks with many shops going down for mass vacations. How-

ever, even after resumption of operations, not much change in demand conditions is anticipated since foundry business, especially among the lighter shops, continues in the doldrums. Some foundries will take in iron during the vacation suspension. Resumption of production by the Toledo stacks after a nine weeks' strike by AFL union workmen has removed some of the threat of iron shortage in this general area due to widespread suspension of pig iron production because of the strike.

Iron Ore . . .

Iron Ore Prices, Page 163

Cleveland—Movement of iron ore on the Great Lakes has just about halted because of the strike. Shipments in the week ended June 30 totaled only 58,365 gross tons, all from Canadian ports. In the corresponding week last year total shipments were 3,201,028 gross tons, of which 3,128,344 were from U. S. ports and 72,684 from Canadian ports.

Shipments for the season to date total 21.502,458 gross tons, of which 21,061,078 were moved from U. S. ports, a drop of 10,002,147 tons compared with the season movement at this time last year of 31,063,225 tons.

Last week Charles M. White, president, Republic Steel Corp., expressing amazement that nothing is being done to speed resumption of iron ore shipments on the lakes, warned that the consequences will be serious. Three weeks of next winter's ore supply already has been lost. Each day during this shipping season, according to Mr. White, enough ore must be brought down for one day's current needs plus five-sevenths of a day's needs for the five winter months when the lakes are not navigable.

Scrap . . .

Scrap Prices, Page 164

Philadelphia—Buying of scrap for the Fairless Works, United States Steel Co., Morrisville, Pa., has begun. Fairly good quantities of No. 2 heavy melting and No. 2 bundles are being purchased at around $38 delivered. Shipments are now beginning. Tonnage will be stocked pending operations of the new open-hearth department, still some weeks off. No scrap has yet been reported placed for blast furnace use at Morrisville.

Purchases for Morrisville have tended to strengthen and also to stabilize the market for the time being on the leading open-hearth grades. No. 1 busheling and No. 1 heavy melting steel are nominally higher around $40-$41. Borings and turnings are unchanged. No. 1 cupola cast is easier at $36-$38 delivered and heavy breakable cast at $38.50-$39.50. Machinery cast, on the other hand, is stronger at $44-$45 delivered.

Detroit—Scrap prices are showing no signs of dropping. Cast is firming and is in greater demand. Dealers are complaining that hot weather has cut collections. A small buy of blast furnace material at the ceiling is not regarded as a representative sale but it indicates a possible trend.

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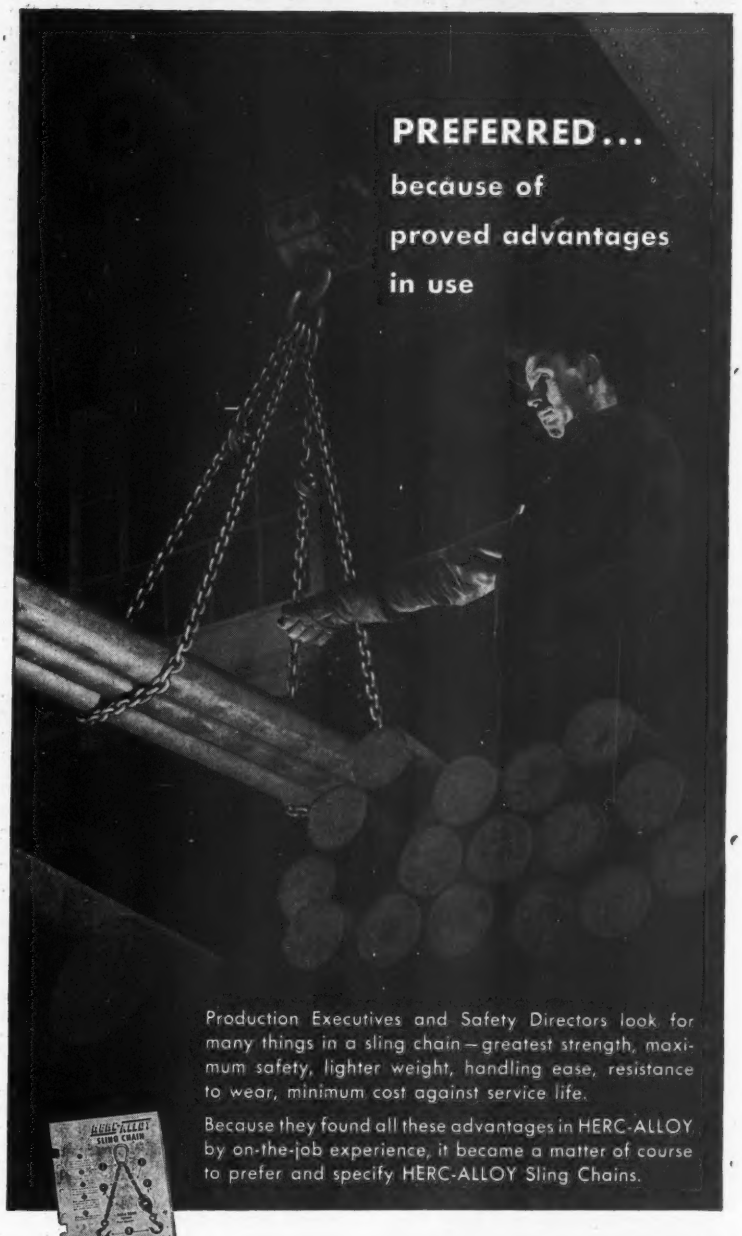

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Probable shortage of iron ore will put pressure on blast furnace grades.

Almost 50 per cent of the area's steelmaking capacity is back in operation. That partly accounts for disinclination of traders to offer material under ceiling. Also, much of this area's scrap bypasses dealers and goes directly to mills. Generators are applying pressure to get ceiling prices. There are few distress offerings. Shutdown at generating plants will worsen the supply outlook. Another buoyant factor is conversion. Several automakers are trying to pin down conversion deals.

Boston—On the limited volume of steel scrap shipped prices are lower, $27 to $29 shipping point prevailing on heavy melting grades. Buying is near a standstill also in cast grades which are quoted well below government ceiling prices.

Pittsburgh—District scrap buyers are keeping close tabs on the market to see whether price weakness spreads. A limited tonnage of No. 2 bundles was bought by a district mill at $40 and other mills in the area say they could have duplicated this purchase. Top open-hearth grades continue to hold firm.

Buffalo—Scrap prices are weak but nominal with thousands of tons of material piling up in dealers yards and on barges along the waterfront. On the basis of dealer sales, prices are off $5 to $6 per ton for steel and cast grades. Shipments from industrial plants, especially automotive shops, are off sharply.

Cleveland—Easy tone prevails in scrap market here but in the absence of active trading prices are nominal. Mill inventories are substantial, in excess of 60 days. Consequently, scrap trade interests anticipate a period of easiness following the ending of the steel strike during which time the market will be under pressure from consumers for lower prices. Currently, yard stocks are large but so far as can be learned no distress material has appeared.

Chicago—Except for shading of about $1.50 on blast furnace material purchased by an out-of-state consumer, the situation here remains static. A depressed tone prevails, giving rise to speculation over prices on open-hearth material when the strike ends. Starting last week, generation of scrap is declining as manufacturing plants close or curtail operations for lack of steel. Northwestern Steel & Wire Co., Sterling, Ill., settled its strike and restarted its electric furnaces. It gave brokers instructions to resume scrap shipments.

St. Louis—Cast grades are strengthening for the first time in months. Some mills and foundries are entering this market with inquiries and a few purchases for post-strike use, some at higher prices. Laclede Steel Co. and Scullin Steel Co., both recently out of the market, are negotiating for cast. Empire Steel Corp. in Ohio is reported paying $15 to $16 freight for cast from this district. Meanwhile heavy melting steel is softening. Laclede took a token tonnage of No. 2 steel at $37 delivered to relieve a local pile-up of the metal on dealers. This was the first sale in months under the ceiling. Dealers are getting badly overloaded.

Birmingham — Some semblance of life is evident in the district scrap market with reports that tonnages of stove plate and cupola cast were bought by cast iron pipe plants here. Unofficially, the figure was reported at $41 and $37, respectively. There still is no demand in this area for open hearth scrap.

San Francisco—The steel strike has given the scrap market a weak tone. One of the two mills in this area which has operated throughout the strike period is paying $27 a net ton for what it describes as "preferred mixed scrap." That is a drop of $2 a ton in the last week. Meanwhile, dealers' position in the market is weakened. Scrap is backing up at their yards. Cast grades are moving slowly. No. 1 cupola cast is holding at $42 gross ton, delivered.

Seattle—While mills are idle, dealers are accumulating stocks of scrap. When operations begin, ample scrap supply to the end of the year is promised. Foundries are operating on a normal basis. Some defense work is on books. Cast iron scrap is no longer a problem, quoted at about $10 under ceiling or $35 to $40 a ton maximum.

Warehouse . . .

Warehouse Prices, Page 163

Cleveland — Warehouse inventories are shrinking steadily and are highly unbalanced. Estimates placed stocks as of June 1 at 35 per cent below the tonnage held Sept. 1, 1949. Since then they have been reduced sharply though demand has not been as pressing as had been expected. Curtailed manufacturing schedules on a wide scale beginning this week will further reduce the pressure on distributors. Warehouse operators anticipate tight supply conditions through remainder of the year because of the loss of tonnage during the steel strike. This will extend even to sheets, which in recent months, have been plentiful. Indications are the distributors will not be able to make up the tonnage lost to them during the period of interrupted mill shipments. However, they are hopeful their reciepts after the strike will be continued on the 100 per cent of base period tonnage basis, though suggestions have been made to reduce warehouse tonnage in proportion to the tonnage loss in mill production.

Philadelphia — As predicted, June warehouse business was off from that of the preceding month. Most distributors see little likelihood of any improvement this month.

Pittsburgh—Withdrawal of material for vital defense projects from district warehouses failed to materialize. It wasn't because there was lack of co-operation between either the union or the operators of the struck warehouses, but there just wasn't any material that fitted into these classifications. District warehouse customers face a bleak future. Warehouses still operating are practically out of standard items and the three strike-bound warehouses will be able to supply little relief when they open their doors.

Chicago—Clip at which steel is moving out of warehouses will soon

ATLANTA, Ga., Alpine 4885
Morrison-Drabner Steel Co., Inc.
BALTIMORE, Md., Peabody 7300
Hill-Chase Steel Company of Maryland
Asheboro, N.C.: Phone 8849
Richmond, Va.: Phone 7-4573
BEAUMONT, Tex., Phone 4-2641
Standard Brass & Mfg. Co.
CHICAGO METROPOLITAN AREA
Korhumel Steel & Aluminum Company
Evanston, Ill.: Ambassador 2-6700
CINCINNATI, Ohio, Wabash 4480, 4481
Morrison-Drabner Steel Co., Inc.
CLEVELAND, Ohio
Nottingham Steel Company
Atlantic 1-5100
Copper & Brass Sales, Inc.
Endicott 1-6757
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Standard Brass & Mfg. Co.
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Korhumel Steel & Aluminum Company
Franklin 5361
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Industrial Metals, Inc.
LOS ANGELES, Calif.
Eureka Metal Supply Company
Mutual 7286
Earle M. Jorgensen Co.
Lucas 0281
Reliance Steel Company
Adams 6133
MILWAUKEE, Wis., Evergreen 4-6000
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MINNEAPOLIS, Minn.,
Korhumel Steel & Aluminum Company
Gladstone 5943, Prior 4030
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Orleans Steel Products Co., Inc.
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Lyndhurst: Rutherford 2-8100
New York: Chelsea 3-4455
Newark: Humboldt 2-5566
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Earle M. Jorgensen Co.
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Profile Supply Company
PHILADELPHIA, Penna., Delaware 6-5400
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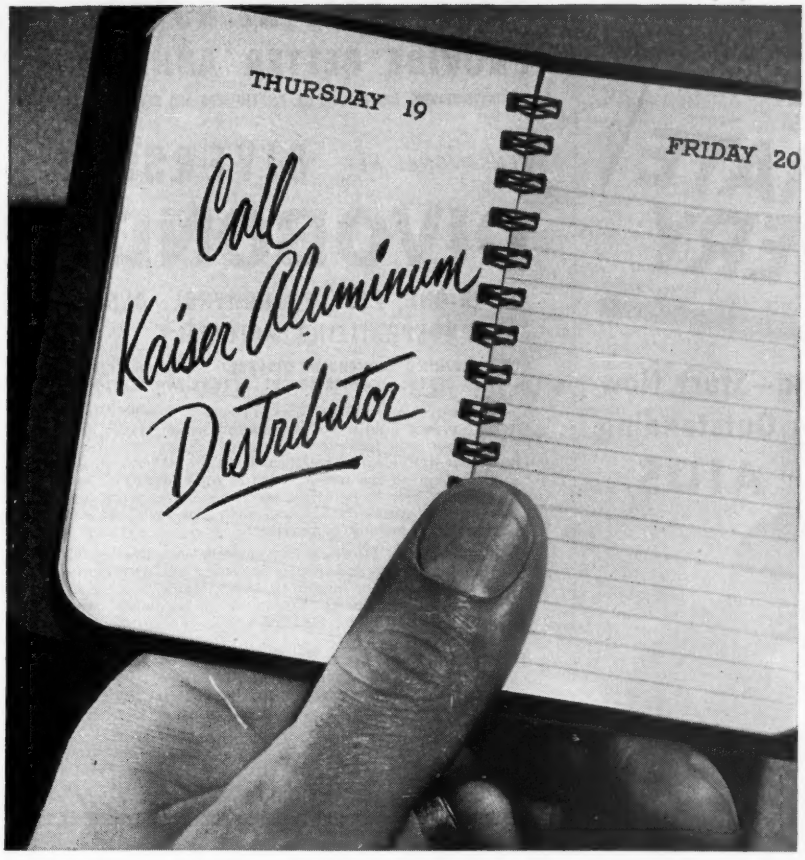

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have premises picked bare. In no product is there any semblance of inventory balance.

Los Angeles—Some warehouse inventories are being strengthened by arrival of steel in transit at time of strike.

San Francisco—The steel strike has given impetus to warehouse sales but pressure has not been too great. Some sellers have been getting material from the mills which have continued to operate, but imbalance in inventories has increased.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3700 tons, including 2500 tons fabricated structural steel, balance 700 tons counterweight and miscellaneous, double-leaf bascule bridge, Chelsea river, Boston-Chelsea, Mass., to American Bridge Co., Pittsburgh, $2,939,976; Phoenix Bridge Co., Phoenixville, Pa., second low, $3,128,000.

2850 tons, office building, Simon Bros., New York, to Harris Structural Steel Co., that city.

1200 tons, underpass, dike and bridge alterations, West Springfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through Berke-Moore Co. Inc., Boston, general contractor.

788 tons, state bridge, Herkimer county, New York, through Collins Bros., to American Bridge Co., Pittsburgh.

665 tons, Y.M.C.A. building, New Britain, Conn., to A. O. Wilson Structural Co., Cambridge, Mass., through Wadhams & May, Hartford, Conn., general contractors; reinforcing bars to Scherer Steel Co., Hartford, Conn.

500 tons, prefabricated hangar, Boeing field, Seattle, to Anderson Structural Steel Co., Los Angeles, low $110,500, by King county, Washington, commissioners.

170 tons, laboratory extension, Electro-Metallurgical Division, Union Carbide & Carbon Co., Niagara Falls, N. Y., to Bethlehem Steel Co.

145 tons, tees and angles, Navy Purchasing Office, Washington, to Southern Galvanizing Co., Washington.

110 tons, Jewish center, Brooklyn, N. Y., through Great Eastern Victor Corp., to Bethlehem Fabricators Inc., Bethlehem, Pa.

100 tons, David Smith warehouse, South Plainfield, N. J., to Bethlehem Steel Co.

STRUCTURAL STEEL PENDING

1000 tons, University of Oregon hospital, Portland, Oreg.; bids Aug. 13.

1000 tons plus, Bonneville Power Administration office building, Portland, Oreg.; bids July 22.

900 tons, field house, Northeastern University, Boston, Mass., out to general contractors.

780 tons, state bridge, Nassau county, New York; Rusciano & Son, Bronx, N. Y., low on general contract.

555 tons, Morgan River bridge, Baltimore; Allied Contractors Inc., low on general contract.

553 tons, state bridge work, Lehigh and Northampton counties, Pennsylvania; F. D. Kessler, Inc., low on general contract.

500 tons, substation steel for Bonneville Power Co., Portland, Oreg.; Emsco Derrick & Equipment Co., Los Angeles, low $162,727 f.o.b. Los Angeles; Bethlehem Pacific Coast Steel Corp., Seattle, low $166,572, f.o.b. Seattle.

453 tons, bridge, North Branch, Patapsco river, Baltimore; Empire Construction Co., low on general contract.

Unstated, Idaho state bridge, St. Maries; Hansen & Parr, Spokane, Wash., low $585,041.

Unstated, Idaho state highway bridge, Idaho county; Tony Marrazzo, Boise, low $262,365.

Unstated, emergency gates, bulkheads, etc., Lucky Peak dam; bids to U. S. Engineer, Walla Walla, Wash., July 9.

Unstated, Little Nilchina and Caribou Creek bridges, Glenn highway, Alaska; general contract to J. J. Badraun, Seattle, low $248,916, by Alaska Road Commission, Juneau.

REINFORCING BARS . . .

REINFORCING BARS PENDING

365 tons, mostly mesh, reinforced concrete highway, North Kingston-South Kingston, R.I., bids July 9, Providence.

200 tons, Washington state highway projects, Pacific and Lewis counties; bids to Olympia, July 15.

140 tons, Quinapoxet dam, Worcester, Mass., bids in.

PLATES . . .

PLATES PLACED

1215 tons, hull plates, medium tensile, black, Navy Purchasing Office, Washington, to Columbia-Geneva Steel Division, U. S. Steel Co.

415 tons, one tank, Hartford, Conn., and three tanks at Plattsburg and Ossining, N. Y., Socony Vacuum Oil Co., New York, to Bethlehem Steel Co.

220 tons, jet fuel storage tanks, McChord air field, Washington state, to Consolidated Western Steel Corp., Seattle.

PLATES PENDING

550 tons, steel sheet piling, also miscellaneous steel, shore lock and moorage wall, McNary dam; materials furnished by government; bids to U. S. Engineer, Walla Walla, Wash., Aug. 5.

PIPE . . .

CAST IRON PIPE PENDING

100 tons, 12 inch, Seattle system extension; general contract placed.

Unstated, Wallingford - Densmore extension, Seattle; installation bids July 2, city furnishing pipe.

Unstated, 10,700 feet 12 inch, also smaller sizes; bids to Marysville, Wash., July 7.

STEEL PIPE PENDING

Unstated, 25,750 feet 12 to 3 inch mains; bids to Clifford Kail, secretary, Yakima-Tieton Irrigation District, Yakima, Wash.

RAILS, CARS . . .

LOCOMOTIVES PENDING

Transportation Corps, five small industrial diesel-mechanical locomotives; bids asked. List comprises four 3-ton units, 600-millimeter gage and one 5-ton unit, 685-millimeter gage; all are scheduled for operation in Turkey.

RAILROAD CARS PLACED

Apalachicola Northern, 100 pulp wood cars, to Pullman-Standard Car Mfg. Co., Chicago.

Gulf, Mobile & Ohio, 50 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

U. S. Army Transportation Corps, 204 eighty-ton flat cars, to Mt. Vernon, Illinois, shops of Pressed Steel Car Co. Inc.

RAILROAD CARS PENDING

Transportation Corps, 135 mechanical refrigerator cars; bids asked.

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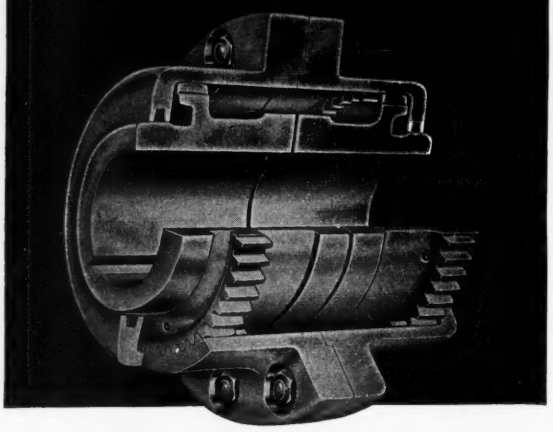

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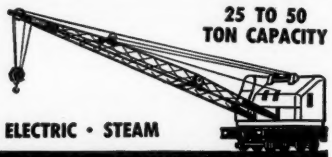

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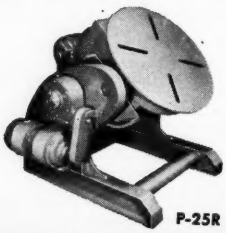

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CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Crawford Heads Refractories Group

J. L. Crawford, president, Walsh Refractories Corp., St. Louis, was re-elected president of Refractories Institute at the annual spring membership meeting. W. A. Turner, president, McLain Fire Brick Co., Pittsburgh, was re-elected treasurer.

AMF Plans Plant Expansion

American Machine & Foundry Co., New York, plans an expansion of its plant facilities in Cheektowaga, N. Y., to take care of mounting production activities.

Manitowoc Shipbuilding Reorganizes

Manitowoc Shipbuilding Co., Manitowoc, Wis., split up into three corporations, each of which will engage in a portion of the firm's business. Shipbuilding, dry docking and ship repair will be performed by Manitowoc Shipbuilding Inc. Manufacture of cranes and shovels will be performed by Manitowoc Engineering Corp. Metal cabinets, refrigerators and other light fabricated metal products will be made by Manitowoc Co. Inc.

Intensifies Forgings, Castings Sales

R. M. Maxwell and P. S. Oliver organized a partnership to continue and expand the sales functions of Industrial Castings & Forgings Co., Pittsburgh. The company represents steel and nonferrous forging and casting companies in the tri-state area.

$1 Million Laboratory Planned

Preliminary plans are complete for erection of a $1 million addition to the research laboratories of Union Carbide & Carbon Corp. and Electro Metallurgical Co. in Niagara Falls, N. Y.

International Harvester Equips Plant

Tools for producing parts for military jet planes are being installed by International Harvester Co., Chicago, in its new $5 million plant in Broadview, Ill. McCormick Works Division of the firm has the contract for manufacture of the parts.

Hydropress Consolidates Offices

Hydropress Inc., Loewy Rolling Mill Division, and Loewy Construction Co. Inc. consolidated their offices at the Empire State Building, 350 Fifth Ave., New York.

Standard Pipe Erects Houston Plant

Standard Pipe Supply Co. is erecting a $500,000 plant in Houston for processing and renovating oil field pipe. The project comprises five buildings, including a processing plant and a warehouse. Gerald Rauch is president.

Reliance Appoints Representative

Reliance Division, Eaton Mfg. Co., Massillon, O., appointed the firm of Grether & Grether, Stockton, Calif., as its representatives for the company's products in the Rocky Mountain area.

Cessna Aircraft Opens New Plant

Cessna Aircraft Co., Wichita, Kans., moved its Industrial Hydraulics Division to its new plant located at Hutchinson, Kans. The plant has manufacturing floor space of 130,000 square feet. Due to the rapid expansion of business, company officials deemed it advisable to segregate this division from the military and commercial aircraft activities. A large portion of the high production and

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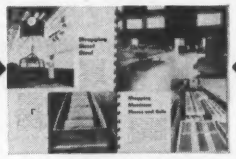
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Welder Burns a Furnace

A welder burns the finishing touches on the boiler-furnace section of the spreader-stoker-fired steam-generating unit at the B. F. Goodrich Co., Akron. Rising 38 feet above the floor, this section of the unit will have a temperature range of 2000 to 2500° F. The generator is designed to deliver 200,000 pounds of steam per hour, continuous, at 250 pounds per square inch at 525°F

precision machine tools is being moved from the Wichita plant and is being supplemented by new multispindled chucking and bar equipment. New plating, processing and brazing equipment also is being added.

Douglas Aircraft Plans Expansion

Douglas Aircraft Co., Santa Monica, Calif., Division, will construct a $450,000 engineering building to house 400 engineers, and a radio and radar test building.

Kellogg Building $1 Million Plant

M. W. Kellogg Co., New York, a subsidiary of Pullman Inc., Chicago, is building a $1 million plant in Jersey City, N. J., to meet increasing demand for fluorocarbon plastic, first used at the Oak Ridge, Tenn., atomic energy plant.

Ferro Organizes Japanese Subsidiary

Ferro Corp., Cleveland, opened its tenth foreign subsidiary in Osaka, Japan. Ferro Enamels (Japan) Ltd. is designed to manufacture porcelain enamel "flake," the basic ingredient used in the vitreous coating applied to metal sinks, refrigerator liners, electric and gas ranges, bathtubs and washing-machine tubs. Initial production goal is 5 million pounds of "flake" per year. Substantial increases are expected once the company gets started.

Western Aluminum Expands Facilities

Western Aluminum Corp., Seattle, plans production of 12 million pounds of aluminum products annually, including light gage sheet and foil, coiled sheet, aluminum roofing and other building materials. Facilities were expanded by installation of additional rolling mills, trimmers, press, annealing furnace and other equipment.

Machinery Manufacturers Group Move

American Supply & Machinery Manufacturers' Association Inc. closed its Washington office and moved to 814 Clark Bldg., Pittsburgh.

Continental Consolidates Divisions

Copes-Vulcan Division, Continental Foundry & Machine Co., was formed by a consolidation of Northern Equipment Division, Erie, Pa., and Vulcan Soot Blower Division, DuBois, Pa. General offices and factory of Copes-Vulcan are at 939 W. 26th St., Erie. Principal products are boiler feed water regulators, desuperheaters, pressure reducing valves and other boiler controls and soot blowers. George L. Davis is president of Copes-Vulcan with Edwin W. Nick chairman of the board. William L. Hunter is vice president and general manager. W. N. McCreight is secretary and Edward W. Scarlett controller. D. E. Hibner Jr. is vice president, sales, and consulting engineer; W. J.

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Phone: Grove Hill 6-2600
Fenner Street, Providence, R. I.
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McDonough, general sales manager; Don Allshouse, advertising manager. Clyde E. Smith is vice president, manufacturing.

Apex Smelting To Build in California

Apex Smelting Co., Chicago, organized Apex Smelting Co. of California which will build a plant in Los Angeles. Aluminum and magnesium alloys and zinc-base die cast alloys will be produced. Dwight L. Palmer, assistant vice president and Cleveland works manager, was promoted to vice president and Los Angeles works manager. Charles J. LaFond, controller, was promoted to assistant vice president and Cleveland works manager.

Ft. Worth Steel Moves Branch

Ft. Worth Steel & Machinery Co., Ft. Worth, Tex., moved its Los Angeles district office to 3026 E. Olympic Blvd., that city. The company manufactures V-drives, sprockets and conveyors.

Lockheed Plans $1.3 Million Plant

Lockheed Aircraft Corp., Burbank, Calif., will construct a $1.3 million factory for final assembly of F-94 jet interceptors at the proposed Palmdale, Calif., jet center of the U. S. Air Force. The new facility will adjoin the aircraft company's existing flight-test and delivery station at Palmdale. Completion is scheduled by March, 1953.

Clock Firm Enters Electronics Field

New Haven Clock & Watch Co., New Haven, Conn., extended its activities to the electronics field with purchase of Condenser Products Co., Chicago. The latter company makes equipment for radar, x-ray, television, radio and other electronic devices. New Haven will operate the firm as a division and will continue production at the Chicago plant.

Porcelain Enamel Institute Moves

Porcelain Enamel Institute is occupying new quarters in the Dupont Circle building, Washington. John C. Oliver is secretary.

Kewanee-Ross Corp. Organized

Kewanee Boiler Corp. and Ross Heater & Mfg. Co. Inc., two divisions of American Radiator & Standard Sanitary Corp., Pittsburgh, combined to form a new company, Kewanee-Ross Corp. Kewanee is a leading manufacturer of steel heating and power boilers, with main offices and works at Kewanee, Ill., and an eastern plant at Lebanon, Pa. Ross, recognized leader in the manufacture of shell and tube heat exchangers, surface condensers and allied equipment, has its executive offices and plant in Buffalo. Both units of Kewanee-Ross Corp. will continue to operate as before, maintaining their respective plant locations, sales offices and representatives. Charles H. Currier is chairman of the board while W. Bradford Russell is president of the new corporation.

Felters Co. Appoints Distributor

Felters Co., Boston, appointed Mike Krasilousky Trucking & Millwright Co. Inc., New York, as its metropolitan distributor. The company makes an oil and acid resistant felt padding which functions as an anchor, sound deadener and vibration dampener. It also eliminates the traditional method of fastening machinery and equipment to floors with screws or bolts.

Admiral To Eliminate Subcontractor

Admiral Corp., Chicago, will consolidate production of refrigerators at the expanded Galesburg, Ill., plant in the fall. This plant is operated by Midwest Mfg. Corp., a subsidiary. Some Admiral refrigerators now are produced by another company.

Allis-Chalmers Appoints Agents

Allis-Chalmers Mfg. Co., Milwaukee, appointed as distributors for its motors, controls, pumps, transformers and drive equipment: Electrical Equipment Co., Ft. Wayne, Ind., and Electric Motor Co., Calexico, Calif. The company appointed Emsco Electric Supply Co., Oklahoma City, Okla., as distributor for its motors, controls, pumps and transformers and Electrical Supply Corp., Lubbock, Tex., as distributor for its transformers.

Reed-Prentice Moves Branch Office

Chicago branch sales office of Reed-Prentice Corp., Worcester, Mass., is moving into new quarters at 4001 N. Elston Ave. The company makes plastic injection machines, die casting machines and portable timber saws.

Yale & Towne Buys American Sintered

Yale & Towne Mfg. Co., New York, will purchase American Sintered Alloys Inc., Bethel, Conn., manufacturer of sintered powdered metal products which are used principally as components in the end products of other manufacturers, including Yale & Towne. The latter company will operate American Sintered Alloys as another of its manufacturing divisions and will continue the sale of sintered metal components to other manufacturers through Eugene P. Pack & Associates.

Ordnance Division Reorganized

Ordnance Development Division, National Bureau of Standards, Washington, was reorganized into three new divisions. The three divisions and their chiefs are: Division 13, Ordnance Development Program A, M. G. Domsitz; Division 16, Ordnance Development Program B, Jacob Rabinow; Division 17, Ordnance Development Program C, Dr. Harold Goldberg. Wilbur H. Hinman Jr., formerly chief of the Ordnance Development Division, was appointed to the newly established position of associate director.

Longley Distributes Carbide Blanks

Allegheny Ludlum Steel Corp., Pittsburgh, appointed Truman E. Longley Co., Cleveland, as northern Ohio jobbers for its Carmet carbide blanks.

Quaker Rubber Opens Dallas Branch

Quaker Rubber Corp., division of H. K. Porter Co. Inc., Philadelphia, opened a branch warehouse and sales office at 1327 Levee St., Dallas. The branch will stock rubber conveyor and transmission belting, hose, packing and molded rubber products. D. C. Hahn is district manager.

Ajax Appoints Three Representatives

Ajax Electric Co., Philadelphia, manufacturer of electric salt bath furnaces for the heat treating of metals, appointed Samson Sales Co., San Francisco, as its agent in Nevada and Northern California. Ajax also appointed as representatives: Richards-Conant, Denver, and W. E. Hartley, Seattle. Territory of Joseph M. Hallorn was extended to include all of New England.

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Hankison Plans Further Expansion

Hankison Corp., manufacturer of compressed air filtering devices and special pumps, moved its manufacturing facilities and general offices to 951 Banksville Rd., Pittsburgh. Further expansion of the plant within the next year is planned.

Conoflow Appoints St. Louis Agent

Conoflow Corp., Philadelphia, manufacturer of pneumatic control equipment, appointed Bruce Greaves Co. as representative in the St. Louis territory.

Stolz Sheet Metal Co. Gets Charter

Stolz Sheet Metal Co., Ponca City, Okla., was granted a charter for operation. Incorporators are: Matt M. Stolz, W. J. Casemore and Lee Pappan, all of Ponca City.

Perfection Names West Coast Agent

Leo J. Meyberg Co. was appointed distributor in California and western Nevada of products made by Perfection Stove Co., Cleveland. The Meyberg firm has offices in Los Angeles and Fresno, Calif., in addition to its main office in San Francisco. A. H. Meyer is president.

Electro-Forge Division Organized

Massey-Harris Co. Ltd., Toronto, Ont., organized a new manufacturing research and sales unit. Known as the Electro-Forge Division, it will engage in manufacture and distribution of various models of a new forging machine. Production will be carried on in a new suburban plant recently acquired by the company.

Torrington Forms New Division

A separate division has been established by Torrington Mfg. Co., Torrington, Conn., for sales and other activities in connection with the company's production of spring coilers, spring testing instruments and other spring-making machinery. John C. Bate, formerly assistant sales director, Machine Division, was promoted to sales director, Spring Coiler Division.

Trane Co. To Expand Scranton Plant

Trane Co., La Crosse, Wis., will expand its plant in Scranton, Pa., by enlarging the present building by about 23,000 square feet. The project is slated to begin in July and will be finished early in 1953. It will be devoted to production of a new product in the Trane line.

Fullerton Expands Product Line

Fullerton Steel & Wire Co., Chicago, added the Federal-Mogul line of bearing bronze bars as the latest step in its stock expansion program. Federal-Mogul Corp., Detroit, has been a leader in the bearing business for 50 years.

Shell Oil Plans $7 Million Unit

Shell Oil Co., New York, will spend $7 million to erect a 52,000-barrel-per-day crude distillation unit at its Wilmington, Calif., refinery unit.

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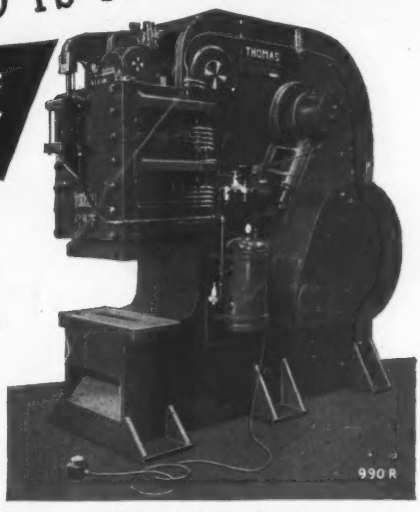

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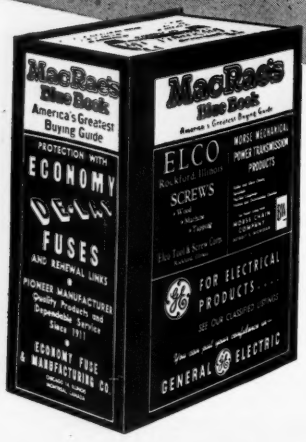

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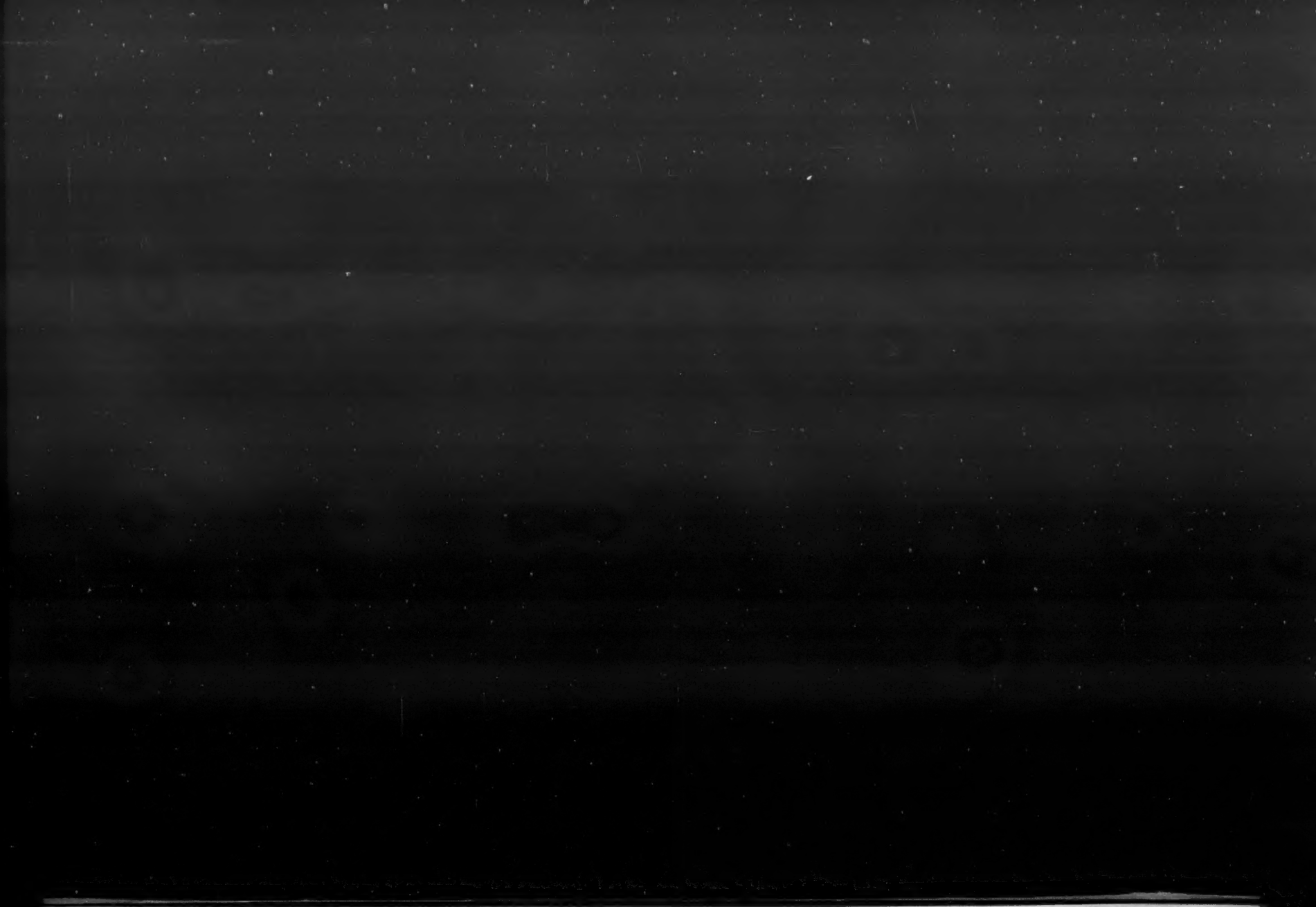
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